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CORE

THE VOICE OF MINERAL EXPLORATION

FALL 2022

PDAC

A TIME FOR REFLECTION

ARTICLES & INTERVIEWS WITH PDAC'S FIRST INDIGENOUS PRESIDENT GLENN NOLAN & ORANGE SHIRT DAY FOUNDER PHYLLIS WEBSTAD, PLUS HOW TO BRIDGE THE GAP BETWEEN FINANCIAL & SOCIAL RESPONSIBILITY IN THE INDUSTRY

CORE

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INDUSTRY NEWS

FALL 2022

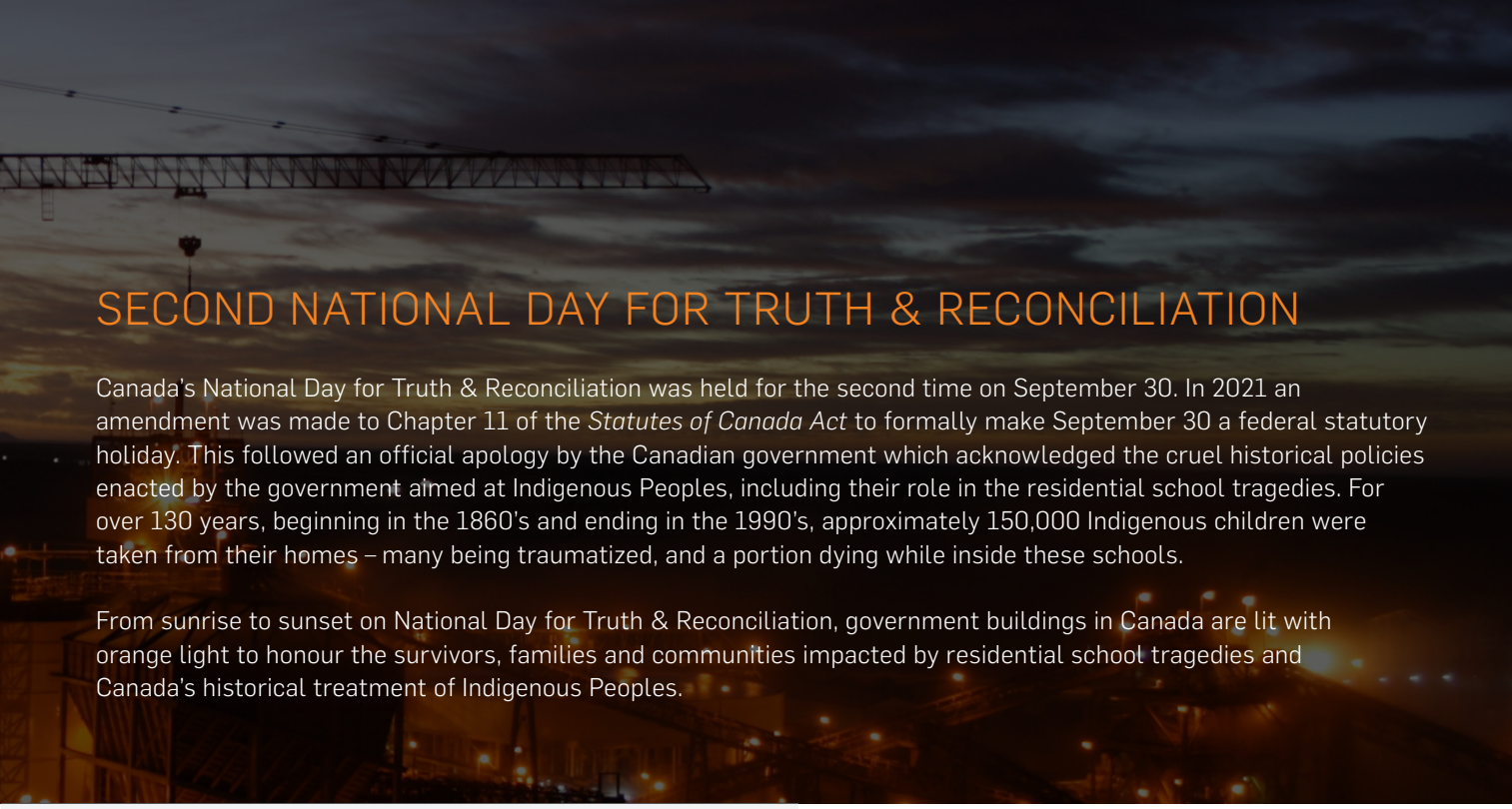
CANADA POSITIONS ITSELF AS A GLOBAL LEADER FOR CRITICAL MINERALS

Since the federal report "Positioning Canada as a Leader in the Supply and Processing of Critical Minerals" was released, the Canadian government has made investments and developed policies and programs to support the industry's goal to increase critical mineral production.

The objective is to make Canada one of the world's premier suppliers of the critical minerals used in the creation of clean energy technologies.

The report lists 10 recommendations that include working with Indigenous communities to create a mutually-beneficial strategy, the creation of a federal committee to support more flexible and effective regulations nationally, a proactive policy towards research and development into critical battery minerals, major financial incentives for critical mineral exploration, and more.

In September of this year, PDAC published a discussion paper in response to the recommendations made in the government's report. Our "Written Submission on Canada's Critical Mineral Strategy: Discussion Paper" can be read by clicking this sentence.



SECOND NATIONAL DAY FOR TRUTH & RECONCILIATION

Canada's National Day for Truth & Reconciliation was held for the second time on September 30. In 2021 an amendment was made to Chapter 11 of the *Statutes of Canada Act* to formally make September 30 a federal statutory holiday. This followed an official apology by the Canadian government which acknowledged the cruel historical policies enacted by the government aimed at Indigenous Peoples, including their role in the residential school tragedies. For over 130 years, beginning in the 1860's and ending in the 1990's, approximately 150,000 Indigenous children were taken from their homes – many being traumatized, and a portion dying while inside these schools.

From sunrise to sunset on National Day for Truth & Reconciliation, government buildings in Canada are lit with orange light to honour the survivors, families and communities impacted by residential school tragedies and Canada's historical treatment of Indigenous Peoples.

72 YEAR OLD CRITICAL MINERALS PLANT GETS A MUCH NEEDED UPGRADE

To slash carbon emissions and increase the production of minerals used for electric cars, the Canadian government is spending $222 million to help upgrade Rio Tinto Plc's Fer et Titane plant in Quebec.

This involves replacing the 72 year old coal furnaces with electrified ones, as well as adding a pilot facility that will start processing and refining titanium and scandium – a critical mineral used in fuel cells that, until now, was mostly produced in Russia and China.

The $222 million is part of an overall $737 million investment that Rio Tinto is making to the facility. The support from the federal government will help create up to 150 jobs, and support Canadian production of critical minerals needed for green technologies.

Through this upgrade, the plant aims to cut its carbon output by up to 50 per cent by 2030. However Rio Tinto is also implementing a pilot project at the facility that uses "BlueSmelting", which breaks down minerals at the molecular level before melting. This reduces the amount of energy needed to process them, which the company says could reduce their greenhouse gas emissions by up to 70 per cent.

THE BDC LAUNCHES THE $400 MILLION "CLIMATE TECH FUND II"

The Business Development Bank of Canada (BDC) announced they are launching the second of two funds that will invest in Canadian technology companies with climate projects at the scale-up or commercialization phases.

This fund supports Canada's strategy to reach net zero, as well as to be a global leader in the cleantech sector. BDC's portfolio of cleantech funds and practices include government programs that support startups as well as global institutions.

The Climate Tech Fund I, which was introduced in 2018 as a $600 million investment program, has funded 50 climate and cleantech companies involved in the creation of energy storage solutions, renewables, advanced materials, carbon capture and more.

Between BDC's Fund I and Fund II, $1 billion will be going towards technologies and products that directly rely on the mineral exploration and mining sector to supply.

OCTOBER 2022 WAS WOMEN'S HISTORY MONTH IN CANADA

October 11, 2022 also marked the United Nations' 10th International Day of the Girl Child. This day – established after a Canada-led international effort – was founded to make the world accountable to listen, welcome and be advocates for girls' potential, and invest in a future that believes in their agency.

NATIONAL SECURITY REVIEW BANS CHINA FROM CANADA'S LITHIUM

In November of this year, Canada enacted a stricter policy aimed at international companies investing in the nation's minerals sector. This included notifying a group of Chinese companies – Hong Kong-based Sinomine Rare Metals Resources Co. Ltd, Chengze Lithium International Ltd., and Zangge Mining Investment Co Ltd., from Chengdu, Sichaun in China – to divest their investments in three Canadian-listed junior lithium mining companies.

Industry Minister Francois-Philippe Champagne said the order followed "rigorous scrutiny" by Canada's national security and intelligence agencies looking into international companies with direct investments in Canada's critical minerals industry.

Earlier in 2022, a partnership between Canada, Britain and the United States was established to secure supplies of critical minerals, as global demands rise. While Champagne reiterates that Canada is still open to accepting direct investment from foreign businesses and partners, it is investments made by foreign state-owned entities that will be scrutinized under Canada's new policy.

THE MYSTERY OF THE STOLEN SILVER

A case related to stolen precious metals has made its way into the courts recently. Approximately 18,000 kilograms of silver worth over $13 million (CAD) was delivered under mysterious circumstances to a warehouse in Quebec, and then vanished. It is a tale that may be the subject of the next 'based-on-a-true-story' heist film.

While the civil lawsuit focussed on liability for the missing metal is now in the courts, the theft actually occurred in January of 2020. As court documents tell it, a shipment of silver ingots was on its way from Busan, South Korea with New York as its final destination. There was a planned stopover in Quebec, Canada at a CN rail yard, and this is where the mystery begins. In order to release the 18,000 kilograms of silver so it can be transported from the Quebec rail yard to New York, a secret code was issued by email to a transport company, who were to pick up the valuable precious metal.

However, the email with the code appears to have been intercepted, along with other details of the shipment, so an official-looking pickup request was sent to another trucking company, who delivered the silver to a warehouse elsewhere in Quebec where it was mysteriously moved again. Today, only traces of the stolen silver have been found throughout North America, with no clues as to where the bulk of the shipment ended up.

In 1992, the Government of Canada designated October as Women's History Month. Women have made outstanding achievements throughout Canada's history, and the federal government has recognized the need for celebrating their successes and contributions to the fabric of the nation. For 10 years, organizations and government agencies across Canada have been creating messaging, programs and activities that run for the entire month.

PDAC recognizes that our industry is a male dominated sector, so it is important to make gender diversity and inclusion a priority. Part of this is emphasizing the developments of women in the industry, as well as our goals for the future.

In fact, PDAC's longest running President in the association's history was Viola R. MacMillan, who served for 20 years (1944-1964), and remains the longest running president in the association's history. As an organization with over 6,400 members, we are proud to celebrate Women's History Month and recognize women who for decades have made achievements in strong positions throughout our industry including geoscientists, directors, consultants, experts and CEOs.

DISCUSSIONS OVER DEEP-SEA MINING DURING COP27

At this year's UN Climate Change Conference – COP27 in Egypt – members discussed deep-sea mining and its impact to marine life and the ocean's ecosystems.

While it has been said that deep-sea mining has less of an environmental impact than current land mining practices, the validity of that is now up for debate. Brazil, the Netherlands, Portugal, Singapore, Switzerland and others at COP27 indicated that more research and better environmental protection policies need to be put in place before they would approve mining the ocean floor. French President Emmanuel Macron took a stricter stance at the summit, and called for a full ban on deep-sea mining.

At the same time, on the other side of the ocean in Jamaica, the UN-affiliated International Seabed Authority (ISA) held meetings to discuss fast-tracking regulations for its members to begin mining the ocean floor for critical minerals as soon as 2023. The ISA is comprised of 167 member nations and the European Union, and was established by the UN's Convention on the Law of the Sea treaty to ensure the protection of the ocean's ecosystems during marine mining activity. The general consensus among most of the ISA Council members is that 2023 is now an unrealistic timeline to give broad approvals for its members to conduct full deep-sea mining activity. While more discussions are taking place, they have expressed more thorough research is needed into conservation and environmental regulations.

A TIME FOR INDUSTRY REFLECTION

THOUGHTS, TRUTHS & PATHWAYS TO INCLUSION

We are constantly engaging in conversations and strive to make the policies and programs that our members use more reflective of the voice of Indigenous Peoples.

PDAC has long advocated for the involvement of Indigenous communities in the opportunities generated by the mineral industry.

We recognize that our efforts must continue year-round and cannot be relegated to a single day of reflection. Our encouragement of active community participation is also not solely related to the financial impact that the industry can provide for Indigenous lands - part of PDAC's priorities as an organization relates to environmental stewardship, as well as the health and well-being of individuals.

PDAC advocates for the use of traditional methods and policies that come directly from Indigenous communities when looking at management of lands. For example, the "Caribou, Community & Environmental Protection" article from *CORE Magazine's* summer issue included a Q&A by Sabina Gold & Silver's Matthew Pickard, who spoke about how the company – with all the tools and advancements in science available – still respected and made priority to use Indigenous traditional knowledge when dealing with caribou herds and protecting their habitat when a mining project is taking place.

"*Work with government and Indigenous community partners to come up with a plan. Be sure to communicate effectively and transparently on what you are doing.*"

There is more we as an industry and as individuals can be doing.

> National Day for Truth & Reconciliation is a moment for all of Canadians to reflect on the tragic legacy of residential schools and all the hurt these institutions caused: broken communities, broken homes, and broken hearts.
>
> It is also a moment to think about renewing relationships with Indigenous Peoples and advancing reconciliation based on respect. It is about creating space to be heard and to heal as well as ensuring Indigenous relevancy and resilience.
>
> **- Michael Fox**
> President/CEO of Indigenous Community Engagement (ICE)

The following articles "The Only Mission" and "Having an Impact" contain interviews PDAC was honoured to conduct with Orange Shirt Day founder Phyllis Webstad, and SOOP Strategies' founder and CEO Sabrina Dias, with Stakeholder Engagement Associate Norma Vázquez.

The interviews are followed by "Bridging the Gap" – an article that summarizes some of the priorities of Indigenous engagement for industry stakeholders. This article also describes PDAC's Indigenous Affairs program, and how the program makes its recommendations for greater inclusion and benefits to mineral and exploration entities with Indigenous communities.

First, the following article on pages 10-13 are words by Glenn Nolan. Raised near an operating gold mine in Northern Ontario, Glenn served as Chief of the Missanabie Cree First Nation for three consecutive terms between 2001-2010, after which he became PDAC's first Indigenous President, serving from 2012-2014.

"Reflections on Truth & Reconciliation" was originally an open letter written for the mineral exploration and mining industry.

The following words, interviews and articles represent the current Indigenous perspective inside and outside the industry. They speak of thoughts, truths and pathways to explore towards reconciliation.

Glenn Nolan, past President of PDAC gives his reflections on the industry and his perspective as an Indigenous worker and leader in this landscape.

"Reflections on Truth & Reconciliation" by Glenn Nolan was written in 2021 after Canada's first National Day for Truth & Reconciliation, and the recent discoveries at national residential schools.

Following Canada's first National Day for Truth & Reconciliation on September 30, I'd like to share my thoughts on residential schools, education, and healing.

Over the last few months, as the bodies of hundreds of children have been discovered near residential schools in western Canada, and I'm sure more will be discovered as other school lands are surveyed, I have had a number of inquiries from well-educated friends who want to know more about the residential school system.

One question I was asked more than once, was: "Were there some good things that came out of the residential schools?"

It isn't because these were insensitive or uncaring people. In fact, I believe these are people who really want to understand residential schools and how they have had such a lasting impact on our communities, our families and individuals – sometimes several generations of a family attended these schools – and this is what I told them.

Education, when done correctly, is a catalyst for meaningful, positive change from generation to generation. But when does education become a place of dominance, torture, and sexual and physical assault? When does education rip families apart or force upon the student a worldview that is as different from who they are?

This education system for 'Indians' resulted in whole communities losing their language and culture and their connection to their families. Some suffered through days and nights and months and sometimes years of assaults at the hands of individuals who were supposed to protect and care for them.

Residential schools were not a place of education as we know it today. The schools became a place of sadness, hopelessness, pain and loss; the loss of everything that made these children human beings and tied to a unique culture with history, spiritual beliefs and language.

Without a doubt, what occurred to our youth, families and communities was a tragic multi-year event in our country. It is hard to believe that the intention of the designers of the school system for Indigenous people was an accident. Someone, somewhere, regardless of the era or the region in Canada, should have stood up and said what was happening to Indigenous people was wrong.

Like all Indigenous people everywhere, our history is complicated and – for outsiders – confusing. Some communities are still isolated physically and psychologically from what most of us know as Canadian society. Others, like my community, Missanabie Cree, were more integrated with Canadian society, and today our prosperity, be it financial, social or professional, I believe is directly tied to our integration into the larger Canadian society. What we do have in common with all of the other communities is the impact of residential schools and the trauma our relatives experienced while they were there.

How does a family recover from having its children ripped from their home? Parents were threatened with jail if they didn't have their children ready to be picked up and delivered at the beginning of the school year.

I have an older cousin who was sent to the Shingwauk School near Sault Ste. Marie when he was three. Because of his age, he was put out in the chicken coup during the day because he was too young to attend school. Who thought this was a good idea? My cousin continues to suffer to this day from the trauma he endured at that school.

My grandfather, who attended the St. John's School in Chapleau, Ontario in the early part of the 1900s,

reluctantly shared his experiences while a student there. He spoke of a time when his class witnessed a young student in grade four who had been beaten unconscious by a male teacher. The young boy never came back to school, and the story was that the boy died of his injuries. The teacher was transferred to another school operated by the Anglican Church.

From my perspective, nothing good came from residential schools.

My community, the Missanabie Cree First Nation, was not immune to the impacts of our youth attending residential schools. Missanabie Cree is a signature to treaty nine. Treaty nine covers the northern part of Ontario, an area larger than France. My community signed Treaty 9 in 1905. It took until 2019 before our land was returned to us in the form of a reserve and compensation paid for 114 years of neglect. It challenged our resolve as a community and as families. We lost much over those years, including our language, and many of our relatives died violent or self-inflicted deaths.

We suffered much of what ails many communities today. Add in the removal of our children, the torture, and sexual and physical assault against many of the children of that time. How can one expect people to come out of that without issues?

According to stories I have been told by older relatives, including my dad, the level of domestic violence, sexual assault, and addiction was intertwined throughout families and the community. People died from beatings, being shot, suicides, alcoholism, and car crashes while under the influence. Children, some as young as four years old, were sexually assaulted by close relatives. Our homes were overcrowded without electricity and running water, and some only had tarpaper covering the walls to keep the heat in during the cold winter months.

I think often about where my community is today. I look at the success we have had and continue to have. Our success wasn't without our own trauma, our own self harm, our own actions that took away from our potential. But we succeeded in spite of government indifference, spiritual oppression, and laws and policies that told our people we were less than those Canadians who didn't look like us.

Somehow my community ended up following a path that raised a generation of people up from a very dark place. I believe it was the opportunity of finding meaningful

"Somehow my community ended up following a path that raised a generation of people up from a very dark place."

work at a mine that was in our traditional territory. In 1949, the Renabie gold mine started operations. Many of our men from my community went to work there. Unlike today, the company built a town at the mine to house the families and workers. Those men from the community who went to work there brought their families, and they received more than adequate housing. For the first time in their life, they had running water, toilets inside their houses, electricity and safer fuel oil stoves.

These families that ended up working at the mine started to see a different way to live. What was normal back home – violence and drinking – was a much rarer occurrence. For those who moved to the mining town, it was the beginning of a new way to live – a new normal, if you will.

I believe that the change came about slowly but was also forced by the actions of a few men who had the power to initiate change for the better. One was the mine manager. His name was Bill Moore. He tried to hire from the local population. He also knew that most of the men coming to work for him from the surrounding area had little education. He must have believed that they were good workers and could be relied upon to get the job done.

And many did. Most ended up getting a trade. In the case of my father, he began working at the mine with a Grade 3 education. Through his efforts to make life better for our family, he ended his mining career with four trade tickets. He also served on the local board of education. One of the first Indigenous people in the province to hold a seat on the local board of education. He also became a leader among his fellow workers during his time working at mining operations across Canada.

With his example, all of my older brothers started their careers at the mine, and all of them retired after many years of working in their chosen careers. I began work as a summer student at an iron mine near Atikokan, Ontario. Many families from my community followed a very similar path. Each successive generation exceeded the previous one in education, employment and career achievement. My community has a wide range of professionals, entrepreneurs, educators, and social scientists—all of whom are continuing the path to prosperity for the next generation.

We still have issues that challenge the present

“We also have seen considerable change in the social, financial and spiritual fabric of our community as we grow and strengthen our resolve to look after our future.”
SKOOKUM JIM AWARD
PDAC 2012
Skookum Jim Award
NUNA

leadership of my community. But we also have seen considerable change in the social, financial and spiritual fabric of our community as we grow and strengthen our resolve to look after our future.

I believe that the catalyst for our members was working at the Renabie mine. I also believe that the mine manager started a community that was accepting of "Indians" to work shoulder to shoulder with non-natives in some challenging and, at times, dangerous situations. Our community members became essential to the well-being of their colleagues while underground or on the surface. When I talked to my father about his time at Renabie, he always said that it was such a change for him. After he started working at the mine, he finally felt that he was contributing to the well-being of his family for the first time. We never went hungry again after he took that job.

Why am I sharing this with you? As part of the National Day for Truth & Reconciliation, I believe that there are some parallels with what my community has gone through over the years. Unfulfilled promises from federal and provincial governments after signing Treaty 9. The issues arising from the treatment of children attending residential schools and the long-standing emotional and psychological damage that was transferred through generations. The harm that many of my relatives did to themselves and others. The social and physical realities that my community had to deal with over half a century ago parallel where many Indigenous people find themselves today. We have all heard about them.

What gives me hope is that there is an industry today that is fuelled by the desire to make a difference in the communities they work with. It took my community years to overcome our demons. But we did. I believe we were able to overcome and persevere because our men were accepted into a work and community environment that was both accepting and respectful. It showed those men that they could provide for their families and feel good about the work they did.

Today we look to our past, which shows us the reality of where we came from. I also believe today is a time to look to the future and decide where we can go and how, as Indigenous people, we can succeed and prosper through meaningful dialogue and action with industry partners.

That is where all of you come in. Can you imagine how much can change for the communities that are living close to mining projects? What happened with my community back then wasn't about the mine manager having a grand plan for inclusion. It just happened because he set about making the work environment and community life open and welcoming regardless of who was coming to work.

Can you imagine how much change can occur when communities and companies work together to facilitate change? I believe that is what has been happening throughout the mining industry, and more recently, we have been seeing greater participation by communities through partnerships, training, and direct and indirect employment.

I always look forward to hearing about what one company or another is doing because it raises the bar for the rest of us. When one community prospers, we all prosper. When one company succeeds, we all succeed.

Despite what the residential schools and the government of the day tried to do with our children, we are still here, more resilient and more determined. I also want to acknowledge how one person or one community can force change. I cannot imagine where my community or my family would be now if my father had stayed where he was, scratching out an existence from the land, hired out as a fishing and hunting guide. I am glad that he took us on this multi-generational journey of change, not who we are but how we live.

Glenn Nolan was the first Indigenous President in the organization's history. He has spent his career involved in the areas of resource development, Indigenous relations and government issues. Currently, as a member of PDAC's Indigenous Affairs Committee, he continues his commitment to the creation of greater partnership development between communities and the mineral industry.

THE ONLY MISSION

ORANGE SHIRT DAY FOUNDER PHYLLIS WEBSTAD TALKS TO PDAC ABOUT MINING, THE MOVEMENT AND TRUTH

What started as a healing journey for personal trauma and discovery of local history, quickly turned into an internationally-recognized movement of truth.

It was on the first day at St. Joseph's Mission Residential School in British Columbia that Phyllis Webstad had her new orange shirt taken. That cruel, forceful act from 1973 began a chain of events that would eventually lead to the now-internationally recognized Orange Shirt Day in Canada with the powerful term "Every Child Matters".

Phyllis is Northern Secwpemc (Shuswap) from the Stswecem'c Xgat'tem First Nation (Canoe Creek Indian Band). Now living in Williams Lake, BC, her journey followed a path from her original community, across Canada, overseas to China and back again to Williams Lake, where the St. Joseph's Mission has now been demolished.

The erasure of the building from the grounds does not remove the inter-generational trauma that residential schools across Canada inflicted on Indigenous children and communities. For over 130 years of Canada's 150 year history, approximately 150,000 Indigenous children and families were taken from their homes, stripped of their clothing, culture and spirit. Thousands perishing while away from their families.

As a survivor, Phyllis' own trauma manifested itself physically, and lead to the start of her personal healing journey. On that journey she discovered where her trauma was centred, and that uncovering the truth was an important path towards healing.

We were honoured to talk with Phyllis about truth, reconciliation, and even her time in the mining industry.

> “There can be no reconciliation without truth. And there is still a lot of truth we don’t know.”

Below is the story that came out of our talk with Phyllis.

We started our interview by talking about her experience working in the mining sector.

In 2010 Phyllis was employed by Sona Resources Corporation, who owned the Blackdome mine and mill. The site, which sits about 200 kilometres north of Vancouver, is accessed through the city of Williams Lake in British Columbia, via the Dog Creek community where Phyllis is from.

Her position was Community Relations. As Sona was applying for permits and engaging investors to get the mine and mill site back up and running (production had ceased in 2001), Phyllis’ role was consulting with her communities and the two other nations who shared the land. She arranged meetings with the respective bands and communities in the area, along with Sona board members and staff to ensure the corporation was following proper cultural protocols.

Phyllis recalls the population demographic of the employees at the time was made up of about fifty percent Indigenous workers. She credits the late Nick Ferris – executive chairman of Sona at the time – who made a point to hire directly from the community of the site. Phyllis worked alongside family and close community members who were hired to do water sampling and other technical duties. Some were hired without any mining experience and trained on-the-job, including Phyllis herself. Even her own mother, who went to college for cook training, became one of the head cooks for Sona.

As far as mining practices go, Phyllis had advice for today’s natural resources sector regarding the treatment of Indigenous workers and community engagement.

“*Do what Nick (Ferris) did.*” She advises that companies should not rely on technology to build relationships with Indigenous Communities. Knock on doors; physically meet with local First Nations; show up to meetings in person; be there. Relationships are built by getting to know the people face-to-face and sharing meals. The executive chairman of Sona did just that during her time working on the site, even though he could have simply emailed or called community members.

Phyllis also humourously provided the anecdote that you know the community has accepted you when you start getting playfully teased and earn a nickname. “*You won’t get a nickname by texting.*”

> It took 150 years to get here, and it's going to take that long to build it back up again.

In her perspective, it is also important that a community sees representatives of a corporation making decisions that are best for the people, not what might be the most profitable. Phyllis recognizes this may not be part of the financial mandate for shareholders or board members of a mining operation, and it may even go against company policies directly, but if an action leads to a better outcome for the community, then do it. Always do the right thing.

As Canada recently held its second National Day for Truth & Reconciliation on September 30, Phyllis described her perspective on what businesses and organizations can do to engage Indigenous communities in more proactive ways to better align themselves with the concept of "truth and reconciliation".

Phyllis is quick to inform that "*First, the truth is not yet fully being told. Truth has to come before reconciliation.*"

For Phyllis, there just isn't an answer to the question of "*What could be done today by businesses that would be more in line with 'reconciliation'?*" We are a long way from discovering the whole truth, and there are still serious concerns from Indigenous Peoples that have yet to be met by governments and institutions across the board. This includes overcrowding in communities, the need for more and better housing, economic reconciliation and more. We as a nation are still exploring and consulting - there is still truth to be told, and uncovered.

People are still suffering (and dying) in communities because of the trauma inflicted on them, and the generations before them. The effects of the past 150+ years of colonization in Canada, is still there. As she identifies – some institutions haven't yet acknowledged their own participation in the historical marginalization of Indigenous Peoples. For example, there are historic universities in Canada founded directly on stolen land, yet they continue to operate as if they have the sole right to operate there simply for being physically present on it, without acknowledging the truth of how they got there.

Once the whole truth is out, then the next step is healing and reconciliation. But what does 'reconciliation' look like to Phyllis?

The concept of reconciliation from the Indigenous perspective is quite different from the non-Indigenous. We are seeing the Canadian government and other organizations begin to openly develop programs and

activities aimed at proactively supporting Indigenous communities. But as Phyllis reminds us, there is still much, much more healing to be done before moving forward. "What do you do when people are grieving?" she asks openly. "*We need a lot of prayer, ceremony and spirituality.*"

Increased economic support for communities across Canada is not something that is seen as a true step towards reconciliation. This is because that kind of support – along with solving the water crisis, as well as other issues and concerns that have been discussed previously – are actions that it is felt should already be taken care of.

There are many examples of issues like this that highlight that priorities should be looked at as not just about improving the future, but also preserving the past. If economic support that is under the banner of "reconciliation" is to go anywhere, part of it should go towards language immersion programs. The fluent speakers of Indigenous traditional languages are mostly elderly, and with that, the risk of their language disappearing is very high. By acknowledging that the residential school system that operated for 120 years in Canada, was directly responsible for the stripping of so many people's traditions and languages, communities would be greatly served by money going towards teaching positions and support for people to immerse themselves into their own languages, so they can survive.

A properly funded and implemented language immersion program is the kind of thing that comes out of consultation and discussion. That is the approach that lead to the initial founding of the Orange Shirt Society by Phyllis. One of the major priorities for the organization is to always operate within the Indigenous perspective, and be Indigenous-led.

This mandate is one that Phyllis believes every individual and organization should abide by, and it goes back to her experiences working with the late Nick Ferris in the mining industry. Change, healing and improvements come from dialogue and understanding. When Orange Shirt Day began, it was "*just for the Mission.*" The goal was to give a voice to the trauma that the community had endured at the hands of St. Josephs Mission. By being a voice for the community, she hoped it would open a dialogue with leaders and opportunities for education at the local level. Orange Shirt Day was established to have one day per year where a conversation could be had about the history and impacts the Mission had.

Phyllis credits the Honourable Murray Sinclair, who served as Chief Commissioner of the Truth and Reconciliation Commission (TRC) as the inspiration behind the founding of Orange Shirt Day. She tells us that Sinclair put out a challenge to Canadians: even though the TRC itself had a limited mandate, we need to keep the conversation going. Phyllis' Orange Shirt Day, along with the Every Child Matters movement, was one way of answering that call.

So it was always about being a conversation starter for everyone – Indigenous and non-Indigenous alike. The viral, rapid growth the movement gained after just the first year was something that surprised Phyllis. When we asked her what her expectations were for the movement back when she founded it in 2013 to today – almost ten years later – she said she's watching it all unfold in real-time just as we all are. The swiftness of it led to the formation of the Orange Shirt Society, and while it is still growing, she hopes that it continues being supported and sustained. At 55 years old, she has been with the movement for almost 10 years, and feels "*the organization is still getting organized – there is still lots to do.*"

We asked Phyllis what the ideal Canada looks like 10 years from now. Her response wasn't about advancements in technology or other sci-fi musings.

"It's not about fantasy. It's about visualizing how I want things to really be." Seeing the erasure of negative stereotypes that have followed Indigenous people for centuries would be something to look forward to. She gives a wonderful example of how changes in our education system can help. She points out that, the Williams Lake school district has made Indigenous history part of the curriculum for every grade. "*So in the years to come, you'll have a group of people coming out of classrooms with more empathy and understanding than ever before.*"

This, Phyllis hopes, will change how Indigenous communities, her family, and even herself will be treated going forward. "*Just like a regular human being, not a 'Native person'.*" To the benefit of individuals, a community, or a corporation – everyone is able to move further positively when being treated respectfully.

HAVING AN IMPACT

SURVEYING THE STRATEGY BEHIND THE SOCIAL IMPACT STUDY

The Social Impact Study was a years-long project that aimed to identify the impacts and demands on social infrastructure for Indigenous communities within proximity to mineral development projects in Canada.

Its goal was to create recommendations and practical strategies that resource development companies could use to mitigate the social impacts of their projects on Indigenous women, families and their community. Using a gendered lens, the Study undertook research and interviewed women in host Indigenous communities.

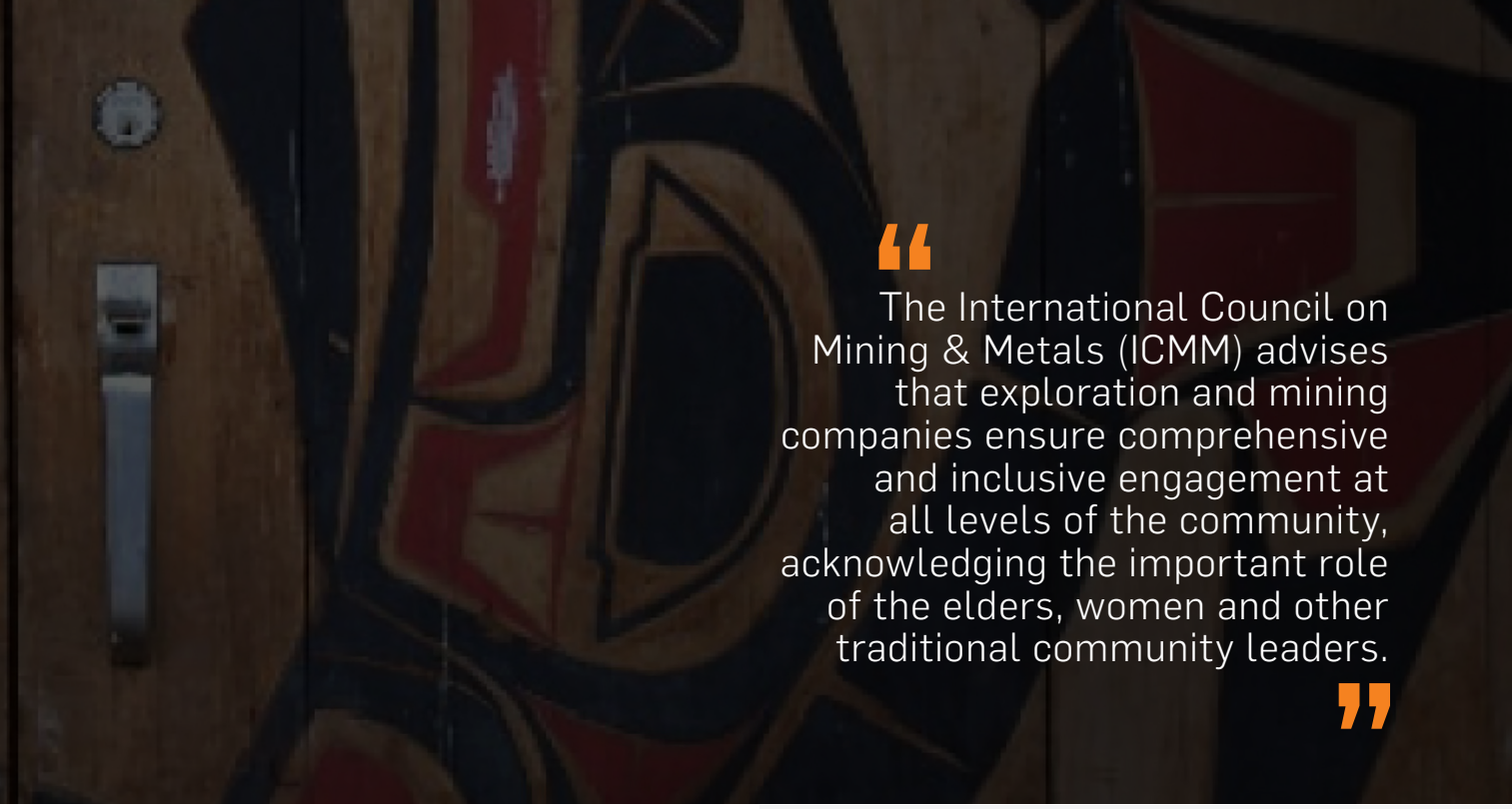
This project was inspired by recommendations made to the extractive sector found in the final report of the *National Inquiry into Missing Murdered Indigenous Women and Girls*. The findings in that report called upon governments and industry to recognize that, "*social infrastructure must be expanded and service capacity built to meet the anticipated needs of the host communities in advance of the start of projects*".

PDAC's Social Impact Study also aligns with the Canadian government's commitment to implement the *Truth and Reconciliation Commission's Calls to Action* and accelerate the *United Nations Declaration on the Rights of Indigenous Peoples National Action Plan*.

With a wealth of experience in the mining industry producing studies, data and impact analysis, community relations and sustainability reports, PDAC engaged SOOP Strategies to complete the Study.

We sat down with SOOP Strategies to discuss the Study and its findings.

The following is a Q&A with SOOP Strategies' founder and CEO Sabrina Dias, and Stakeholder Engagement Associate Norma Vázquez.



> The International Council on Mining & Metals (ICMM) advises that exploration and mining companies ensure comprehensive and inclusive engagement at all levels of the community, acknowledging the important role of the elders, women and other traditional community leaders.

PDAC: When completing the review of existing literature and published material, were you surprised by the lack of research done with respect to Indigenous women?

SABRINA: No we were not surprised. However having worked in the industry we were surprised there still wasn't enough done. The needle hasn't moved in decades. Disappointing. When submitting the RFP originally, my suggestion was to specifically interview women, not just community members in general. It was great that PDAC was welcoming of that suggestion and changed the scope of the research and project for us. We felt our revisions to the scope were in line with the *Missing and Murdered Indigenous Women* report that the RFP used as inspiration.

NORMA: We knew from the beginning we were not going to be surprised. This is why we saw this study as a big opportunity to showcase that this information is not out there, and people should be going after the gendered lens. This was one of the things that made us interested in doing this research. The perspective of Indigenous women is going to be very different talking to women in the community than with the male leaders. Women will see needs and requirements for various other aspects that a new mining project or development will see as a need for the community than the men would. What we can add is we were also trying to get multi-generational views. It was important to us to have a perspective from different generations – youth, elders and ones in the middle.

SABRINA: When we do outreach to stakeholders for this kind of project, typically the list is community leaders, town mayor, elders. However we like to ask for engagement from women and community members in general. Engaging women proactively and conducting research through a gendered lens is something we've always done at SOOP.

PDAC: Behind-the-scenes, how many people would you say were involved in the study?

NORMA: Around 16 people total (including SOOP researchers, Pretivm people, Indigenous community members and leaders), aside from the five interviewees for the study. And, the three advisory panel members – their input was so valuable for this research.

SABRINA: The three Indigenous advisors were all at one time PDAC board members. Their involvement organically came about for the project, as no one on the SOOP team identifies as Indigenous. So that was really helpful that we gained the oversight and input from the Indigenous Affairs panel. They all very graciously gave their time to the report. That was probably the most valuable thing we did, in addition to getting the interviews from stakeholders.

NORMA: They were really good guides, and very, very helpful for the project.

PDAC: Were the Indigenous communities that were part of the study welcoming to this kind of report, or was there hesitancy about it?

SABRINA: The majority were welcoming and saw the value in the project and participated. There was one who was skeptical, and participated, but with skepticism because they said 'We do these all the time, we get asked our opinions, but we never see the outcome. So please make sure to send us the report.' That was something that the advisory panel was very strong on - making sure that the study came full circle and the people who were interviewed had the opportunity to review it before it went public. That was interesting from our perspective as researchers, who ask for people's time, which is not a renewal resource, so we have to make sure we're appreciative and are being respectful of their time, and say 'this is how your time with me will impact the paper, and hopefully will have a longer term impact.'

NORMA: At the same time, people who participated were really generous in the way they were sharing their story. Although there was some skepticism, which was very understandable, there was also a lot of generous sharing from the ladies who participated.

SABRINA: I would say that we also got a few comments at the end of the interviews where they were happy to see this type of research being done. Particularly from the gender perspectives. They would end things by saying that they couldn't wait to read the final report.

PDAC: How long would you estimate the Study took to complete from start to finish?

SABRINA: Longer than scheduled and longer than anticipated. I would say the factors that stretched out the schedule – which is not a bad thing – was scheduling meetings from the stakeholders, and getting feedback who we should interview or not and who we should do outreach to. And, the Indigenous advisory panel members were given ample time to read through the documents and research, which was great, because they all read it, which sometimes never happens. New things also came up during our discussions; stuff you can't always anticipate because this kind of project's scope was new.

NORMA: Also, the changing of the control of the Brucejack project from Pretivm to the new owners (Newcrest Mining Limited) happened right in the middle of everything.

PDAC: We know SOOP has great experience in this area, but was there anything that surprised you from the conclusion of the study?

SABRINA: The value of digital connectivity. We've seen this in other impact studies; it's not just about being able to call home, it's about staying connected to the culture and to the community. When workers are out isolated and in the mine, they have great tech, but back at the local community they do not. So making sure both sides of that digital connectivity is working well, so workers can maintain their relationships by being connected regularly to their family and community while they're away – there's huge value in that.

I liked that one of the outcomes was training and education, not just for the worker, but the family or spouse. They could see what life was like living in a mine site, including flying in and flying out. It showed there was opportunity for more informed decision making as a family to decide if they want to be part of the mining sector. Even though the

money might be good, they can see the potential impacts on the family, relationships and the fabric community. One interviewee mentioned they knew of a person who decided not to apply for a job after doing that training. So I think that 'pre-training' is a fabulous idea.

NORMA: Everyone also talks about the value of mining; good employment, good salaries. But what was interesting was to learn from the women how that bigger salary can impact someone who does not have the financial literacy to manage more money than they were used to. So that was quite an interesting finding – the need for the support of communities in regards to financial literacy.

SABRINA: That type of financial literacy and life skills that workers need is still not part of the program when people do community development and community relations. In projects like ones conducted from 40 years ago, you see an increase in salary, but also an increase in alcoholism, and an increase in divorce or family and social ills.

NORMA: In general we saw a lot of impacts in this report that not many social assessments will bring up, and all of this information came from the interviews. As an example, one of the ladies brought up that when all the men in the community are out working for the mine, so now the fire department were all women. Except all the gear and clothing did not fit them. It's one of those things that is very difficult to see from just a regular social assessment if you do not include that gendered lens.

SABRINA: This impact study was also done at not a 'regular' time in project development. Other impact studies we've done are in pre-project development. But this impact study was done way past a project was developed and is now in operation. So the people being interviewed have experienced those second-level and third-level impacts that they can tell us about. First-level impacts will be employment goes up and a company will aim to hire locally, so they know there will be more jobs and higher wages paid to this community. But a second-level impact would be the impact on the grandmothers that we found through this project. For example, as companies now go to hire more women, you see the women are also away from home for, say, two weeks out of every four. Now the childcare is going to the grandmothers. So how is this impact affecting the elder generation? There is clearly a need for daycare that a traditional first-level impact study would not identify, however this one does.

NORMA: Something that is also important is that we're talking about communities that have a lot of experience in mining, because of the area or location. But if you go to other communities that might not have this experience, then this is where this kind of study becomes very important for companies. This is what experienced Indigenous communities know, so if a company is working in an area with a community that does not have this much experience in mining, then this information can be very valuable.

PDAC: Is there anything else you'd like to say about working on this study, and/or about Indigenous affairs in the industry in general?

NORMA: It was a fantastic experience. Personally I'm quite passionate about stakeholder engagement because there is so much you can learn in the process that is just fascinating.

SABRINA: Personally and professionally it felt in both senses very satisfying to be able to bring gender up front into an impact assessment. I've always been passionate about women's rights and women's representation, so personally it was very satisfying to do this. When Norma and I were welcomed to do this, it was also a rewarding professional experience. We do a lot of projects, and once in a while one comes along that will help move the needle in the industry. I'm really proud of the paper that we put together. It's exciting that we're able to broadcast this as an Indigenous and a gendered perspective for the mineral and exploration sector. I feel like here we've created a piece that will not just sit on the shelf. I feel like we've created a piece of work that we hope PDAC will find useful and move further in the path towards gender and Indigenous equity in mining research. I hope that people will use our results and recommendations, and when they do, they will broadcast it and we'll see that it worked.

BRIDGING THE GAP

HOW CAN MINERAL AND EXPLORATION COMPANIES PROVIDE ECONOMIC BENEFITS TO INDIGENOUS COMMUNITIES THAT ALSO CONTRIBUTE TO COMMUNITY & SOCIAL HEALTH?

In the fall of 2021, PDAC completed their Economic Impacts of Exploration Projects on Indigenous Communities study. The aim of this study was to build greater awareness around the various economic opportunities that exist for communities at the exploration phase of mineral development projects.

The study – overseen by a panel of advisors who each brought regional expertise to the subject matter – was compiled from extensive research, surveys, interviews, and engagements with Indigenous communities.

The study found both systemic and practical barriers hindering the communities' participation in mineral development projects, and offered solutions for communities to help maximize the economic benefits.

But as we saw from the Social Impact Study, a boost in economic well-being does not always contribute to improved social health. Every community has their own social fabric, and traditions vary. A once-size-fits-all approach is just not possible.

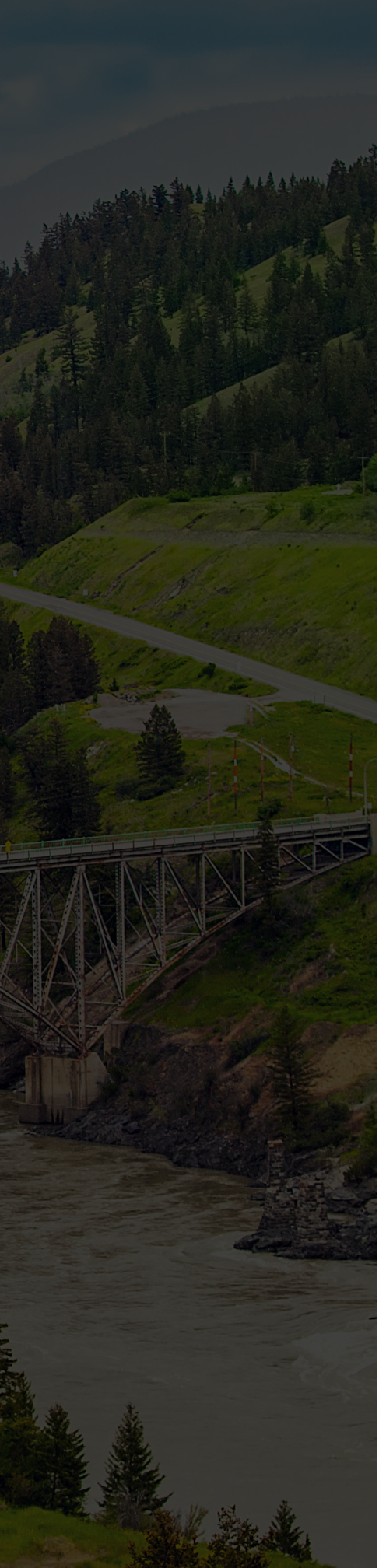
However with early and intensive engagement policies including consultation and inclusion, mineral and exploration companies can learn up front how they can be directly responsible for increasing not just the economic impact of their projects on Indigenous communities, but also contribute to benefiting the community socially.

This is the heart of what PDAC advocates for when our members engage with Indigenous communities on development projects – that the communities are considered and respected as partners and decision-makers when it comes to who/what/where/when/why/how any work takes place.

Ensuring the industry recognizes the importance of incorporating community perspectives is the main function of PDAC's Indigenous Affairs Program.

This program's goal is to foster positive relationships between communities and companies. Our focus in this area has led to the development of tools and resources to encourage greater co-operation between Indigenous Peoples and the mineral industry in Canada, and support communities where mineral opportunities exist.

Our goals are to support both the social, and financial interests of all parties.



Recognizing the importance of Indigenous involvement in opportunities generated by the mineral industry – and the value of incorporating community perspectives – is why PDAC recommends that the federal government support efforts to enhance Indigenous community participation through:

- Foundational social investments that contribute to improved health and educational outcomes for Indigenous communities.

- Targeted funds for skills training and entrepreneurship to assist Indigenous Peoples in securing employment and seizing business development opportunities generated by the industry.

As part of ongoing advocacy, PDAC also encourages Canadian governments to develop mechanisms to share a portion of government revenues generated from mineral development through Government Resource Revenue Sharing (GRRS) models.

GRRS agreements are a means of ensuring that Indigenous communities participate in – and benefit more from – mineral industry projects, and that those opportunities are generated through company-community partnerships. Overall, these agreements help to support community economic development and investment, and GRRS can also enhance initial community support for mineral exploration and development projects which can help foster those company-community relationships.

Today, the conversation around GRRS has grown and PDAC is supportive of government policies and programs that direct a greater proportion of revenues to Indigenous communities derived from mineral extraction projects. We applaud Natural Resources Canada intention to establish a National Benefits Sharing Framework, which has the potential to expand not just economic, but also social benefits to Indigenous communities with direct participation in the mineral industry. All of which contributes to improving the competitiveness of Canada's mineral industry.

The annual PDAC Convention in Toronto, Canada, offers one of the most important platforms for the minerals sector to discuss fostering cooperative, respectful and mutually-beneficial relationships for Indigenous communities. PDAC's Indigenous Affairs Program brings communities, Indigenous-owned companies and industry together in one important setting, to share experiences, exchange ideas and network.

By providing a space for these vital themes to be discussed, PDAC ensures the dialogue continues between interested parties and collaborative efforts are constantly improved.

PDAC 2023

PDAC 2023 CONVENTION

MARCH 5-8, 2023

Since it began in 1932, the annual convention in Toronto, Canada has grown in size, stature and influence. Today, it is the event of choice for the world's mineral industry, attracting tens of thousands of attendees from across the globe for networking events, educational programming, outstanding business opportunities and fun.

“PDAC 2023 will be another industry-leading showcase spread over almost 600,000 square feet of both the North and South Building of Toronto’s Metro Toronto Convention Centre.”

- Alex Christopher
PDAC President

REGISTRATION OPENS THIS DECEMBER!
pdac.ca/registration

EARLY REGISTRATION DEADLINE
FEBRUARY 10, 2023

DEADLINE TO PURCHASE TICKETS FOR SHORT COURSES AND AWARDS GALA
FEBRUARY 24, 2023

*Attendee registration will still be available

1,085

CORE SHACK, INVESTORS EXCHANGE, PROSPECTORS TENT & TRADE SHOW BOOTHS IN 2022

17,445

ATTENDEES FROM

120

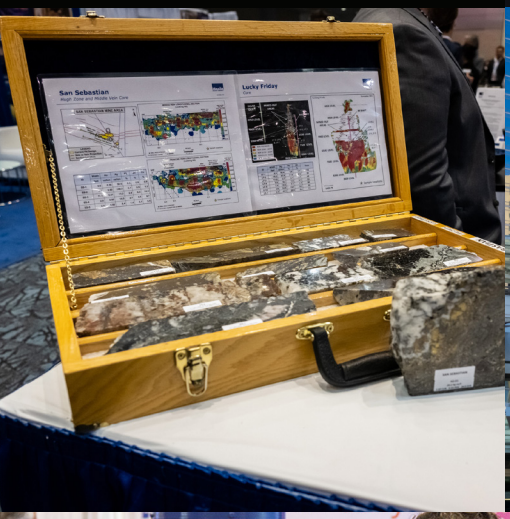
COUNTRIES IN 2022

1,293

2022 INVESTORS

265

SPEAKERS IN 2022



SAVE THE DATE!

MARCH 5-8, 2023

pdac.ca/convention

EXHIBITORS

Spread over both the North and South Buildings of the MTCC, PDAC 2023 will showcase another full slate of exhibitors from across the globe.

TRADE SHOW & TRADE SHOW NORTH

Visit over 600 exhibitors showcasing the world's leading technologies, products and services, and meet government representatives from around the world.

CORE SHACK

Providing a unique venue for companies to display their core samples. Attendees can get up close to new or ongoing projects that are generating exciting drill results. The latest discoveries from all corners of the Earth will be featured along with maps, charts and technical information.

INVESTORS EXCHANGE

Discuss investment potential with 450 junior mining companies, mid-sized producers, major mining companies, financial institutions and prospectors to discover new business opportunities.

PROSPECTORS TENT

Get back to the heart of the industry with a visit to the Prospectors Tent. Self-employed and independent prospectors will be there to discuss their maps, samples and claim results.

STUDENT MINERALS COLLOQUIUM (SMC)

The SMC brings together geoscience students and industry professionals to highlight innovative student research on projects essential for the successful evolution of the modern mining industry.

Students (BSc, MSc, PhD) working on projects linked to mineral deposits including mapping, mineralogy, geochemistry, geophysics, environmental and hydrogeology have the opportunity to share their research with an audience of academics and industry professionals.

To see the PDAC 2023 exhibitors visit pdac.ca/convention/exhibits

PROGRAMMING & PRESENTATIONS

The annual convention hosts a wide range of speakers, industry experts and facilitators offering their knowledge, strategies, new concepts, case studies and more.

EXPLORATION INSIGHTS

Exploration Insights showcases technical, policy and academic presentations that offer insight into current and relevant subjects. The Themes for PDAC 2023 include case histories of gold discoveries, the importance of cut-off grade determination and new techniques for assessing critical minerals targets.

CAPITAL MARKETS

Access to capital is the lifeblood of the mineral exploration industry. This program is intended to create a forum for dialogue on a range of topics related to the financing of mineral exploration.

CORPORATE PRESENTATION FORUM FOR INVESTORS

This popular series features up-to-the-minute information on select exploration and development companies' current activities and investment potential. This series continues to be of strong interest to investors, highlighting the scope of commodities and stage of development represented at the convention.

KEYNOTE PROGRAM

The Keynote Program features four themes designed to inspire and educate: commodities, mineral outlook, technology, and new discoveries. Speakers will discuss new and exciting concepts and explore the compelling challenges of mineral exploration and development in 2023. The premium lineup includes international CEO's, founders of leading businesses, sought-after industry experts and renowned policy makers.

INDIGENOUS PROGRAM

Uncover the fundamentals of building cooperative, respectful and mutually-beneficial partnerships between Indigenous communities and the minerals industry. This program brings Indigenous-owned companies, communities and individuals together with industry to share experiences, exchange ideas and network. Indigenous leaders, industry experts and legal professionals exchange their vision of prosperity and reconciliation with PDAC's global network.

SUSTAINABILITY PROGRAM

Join a facilitated multi-stakeholder dialogue and peer learning on key issues related to responsible exploration and mining. This program features presentations and conversations that examines the innovative ways in which mineral exploration and mining companies are working to improve their sustainability performance. This includes presenting challenges and successes, as well as lessons learned.

TECHNICAL PROGRAM

Industry experts discuss current and emerging trends, technologies, research and analysis in a dynamic series of presentations. Speakers share their practical experience, insights and a look to the future. Sessions will examine various commodities, geological regions, geoscience disciplines, and more.

SHORT COURSES

These are are in-depth educational sessions led by presenters with expertise in a variety of different subject matter.
Short courses are ticketed – purchase online before the deadline!

LETTER WRITER PRESENTATIONS FOR INVESTORS

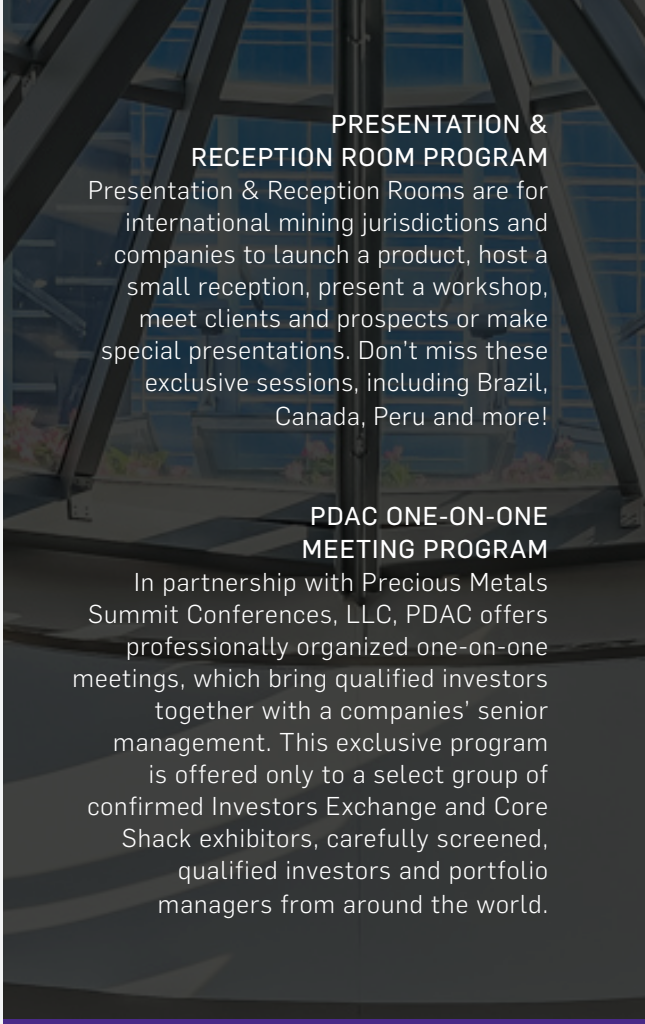
Top newsletter writers present their research reports, charts, thoughts and ideas on how to select profitable investments in the resources sector, including evaluation of projects, companies, and business development.

MASTER CLASS SERIES

Learn from industry leaders as they share key insights and case studies throughout this exclusive series of presentations.

STUDENT & EARLY CAREER PROGRAM

This program allows students and early career individuals to have the unique opportunity to connect with industry professionals from around the globe. Learn about a diverse range of careers and attend engaging presentations to stay up to date on exciting industry developments.



PRESENTATION & RECEPTION ROOM PROGRAM

Presentation & Reception Rooms are for international mining jurisdictions and companies to launch a product, host a small reception, present a workshop, meet clients and prospects or make special presentations. Don't miss these exclusive sessions, including Brazil, Canada, Peru and more!

PDAC ONE-ON-ONE MEETING PROGRAM

In partnership with Precious Metals Summit Conferences, LLC, PDAC offers professionally organized one-on-one meetings, which bring qualified investors together with a companies' senior management. This exclusive program is offered only to a select group of confirmed Investors Exchange and Core Shack exhibitors, carefully screened, qualified investors and portfolio managers from around the world.

Click here for more information on the engaging programming and presentations scheduled for PDAC 2023, or visit pdac.ca/convention/programming

EVENTS & NETWORKING

Don't miss these valuable networking opportunities!

OPENING CEREMONIES

Join Alex Christopher, PDAC President and other special guests as we mark the official opening of the 2023 Convention.

THE NETWORK: FEATURING DUELLING PIANOS

Looking for valuable networking opportunities at PDAC 2023? The Network – PDAC's largest networking event – will connect you with domestic and international professionals where you can discuss matters shaping the industry. Join us for a drink and snacks, mix and mingle with potential business contacts, all while enjoying PDAC's favourite Duelling Pianos by A.B. Live Custom Entertainment.

MINING FOR DIVERSITY

Women in Mining Canada (WIMC) is pleased to host the 2023 Mining for Diversity event. Please join Trailblazer Award Winners and subject matter experts as they discuss key issues affecting the mining industry. Subjects will be based on the focus areas of award winners, and will be announced prior to the event.

WIMC is happy to once again host this annual awards ceremony and networking event. Join us to network with industry professionals, and celebrate the Trailblazer Awards Series winners, including Indigenous Trailblazer, Indigenous Student Trailblazer, Student Trailblazer, and the Rick Hutson Mentor award.

STUDENT-INDUSTRY MIXER

This event provides an opportunity for students, early career and industry professionals to network in a relaxed environment. Recipients of the Mary-Claire Ward Geoscience Award and the ERM Bursary will be announced. Student attendees will also be entered in a draw for tuition top-up awards.

Student groups currently attending a Canadian post-secondary institution who would like to attend this event along with the Student & Early Career Program can apply for travel funding to help offset the costs of getting to Toronto.

AWARDS GALA

The PDAC Awards Gala celebrates excellence in the global mineral exploration and mining industry, and is the ideal place to host your clients and network with key players.

Join us as we acknowledge the extraordinary accomplishments of the 2023 Awards Recipients for the Bill Dennis Award, Skookum Jim Award, Sustainability Award, Thayer Lindsley Award and Viola R. MacMillan Award.

At the gala, enjoy cocktails on arrival, followed by a sumptuous three-course gourmet dinner and fine wines. Tickets to this event sell out quickly, so be sure to buy online or with your registration!

PDAC 2023 will also host a number of invitation-only events during the Convention, including a New Members Networking Reception and Life Member Luncheon.

Click here for a comprehensive list of events and networking opportunities during PDAC 2023, or visit pdac.ca/convention/events-networking

SPONSORS

PDAC would like to thank all of our Convention sponsors for their valued contributions and support.

Sponsorship and marketing opportunities are still available for PDAC 2023. Banking executives, brokers and analysts, fund managers, government representatives, mining media, retail and institutional investors, senior mining executives and students all attend the world's premier mining and minerals showcase. If you would like to showcase your organization to these key stakeholders, gain higher brand exposure through digital and print marketing campaigns, differentiate your company from competitors and earn recognition by over 20,000 attendees from 120+ countries than click this sentence or visit pdac.ca/convention/sponsors/opportunities.

VOLUNTEER OPPORTUNITIES

Save money and network with industry professionals at the convention! Volunteer your time in exchange for a complimentary All Access Pass and materials, volunteer apparel, food vouchers, a gift card and a volunteer certificate. Click here to sign up today!

MEDIA ACCREDITATION

All media and working journalists are encouraged to apply for accreditation to attend PDAC 2023 at no cost. This includes print media outlets, broadcast and online media as well as photojournalists and individuals who have been officially approved by a media organization. Only accredited media will receive a media badge for the event, so apply today by clicking this line or visiting pdac.ca/convention/attendee-info/media/accreditation

PDAC 2023
SAVE THE DATE!
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INFORMATION
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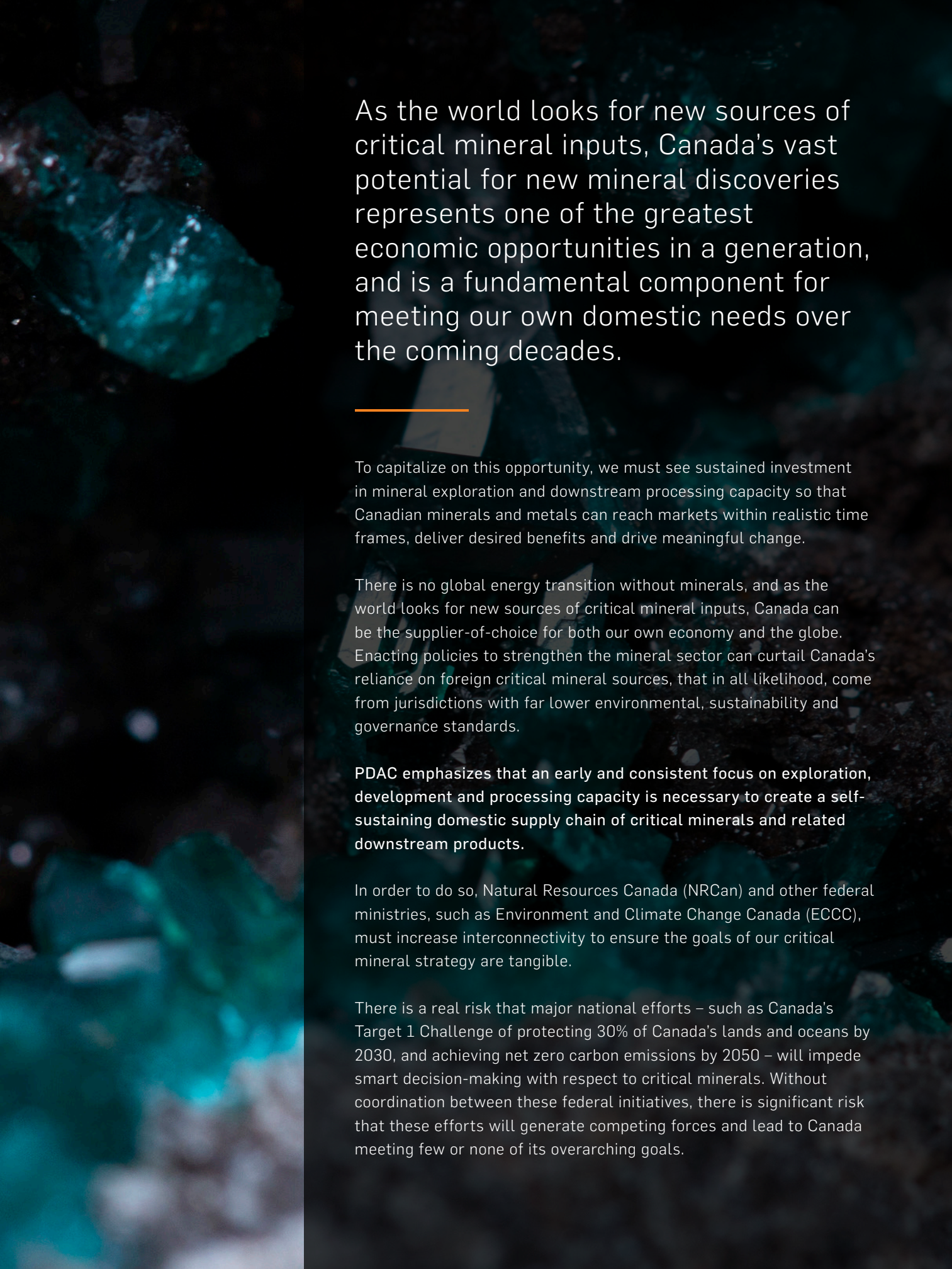
REGISTRATION OPENS THIS DECEMBER!

CRITICAL MINERALS & CANADA'S GENERATIONAL OPPORTUNITY

EXAMINING THE STRATEGIES, GOALS AND POLITICAL LANDSCAPE THAT MAKES CANADA THE SUPPLIER OF CHOICE FOR THE CRITICAL MINERALS INDUSTRY – TODAY AND BEYOND



As the world looks for new sources of critical mineral inputs, Canada's vast potential for new mineral discoveries represents one of the greatest economic opportunities in a generation, and is a fundamental component for meeting our own domestic needs over the coming decades.

To capitalize on this opportunity, we must see sustained investment in mineral exploration and downstream processing capacity so that Canadian minerals and metals can reach markets within realistic time frames, deliver desired benefits and drive meaningful change.

There is no global energy transition without minerals, and as the world looks for new sources of critical mineral inputs, Canada can be the supplier-of-choice for both our own economy and the globe. Enacting policies to strengthen the mineral sector can curtail Canada's reliance on foreign critical mineral sources, that in all likelihood, come from jurisdictions with far lower environmental, sustainability and governance standards.

PDAC emphasizes that an early and consistent focus on exploration, development and processing capacity is necessary to create a self-sustaining domestic supply chain of critical minerals and related downstream products.

In order to do so, Natural Resources Canada (NRCan) and other federal ministries, such as Environment and Climate Change Canada (ECCC), must increase interconnectivity to ensure the goals of our critical mineral strategy are tangible.

There is a real risk that major national efforts – such as Canada's Target 1 Challenge of protecting 30% of Canada's lands and oceans by 2030, and achieving net zero carbon emissions by 2050 – will impede smart decision-making with respect to critical minerals. Without coordination between these federal initiatives, there is significant risk that these efforts will generate competing forces and lead to Canada meeting few or none of its overarching goals.

To position Canada as the top global supplier of responsibly sourced critical minerals into the future, federal and regional governments must:

- Employ science and evidence-based decision-making processes. We must have a fulsome understanding of where critical mineral potential exists, and ensure land conservation decisions are credible, inclusive and evidence-based. To successfully serve the public good, an understanding of where the highest prospects for future mineral discoveries exists is necessary to confidently forecast and make informed infrastructure, energy and conservation decisions.

An increase in public geoscience funding and financial support for provinces and territories to develop comprehensive mineral resource assessment models would add to this evidence base and help inform future policy decisions to avoid sequestration of future opportunities.

- Sufficiently resource relevant departments and agencies to facilitate consistent, predictable and timely application of Acts that directly affect natural resource project development, such as the *Impact Assessment Act, Fisheries Act and Canadian Navigable Waters Act*.

- Support a significant increase in domestic processing and refining capacity to reduce the imbalance of raw material that is transported internationally for value-added processing.

- Expedite Critical Mineral Exploration Tax Credit (CMETC) legislation and align expiry timelines with the regular METC (2027 vs. 2024). The CMETC must also reference Canada's Critical Minerals List rather than incorporating explicit subset lists of minerals into the *Income Tax Act*.

Regulatory and policy factors play a significant role in determining where and how limited exploration dollars will be spent among competing jurisdictions and profoundly influence how often new, economically viable deposits are found. For industry to continue responsibly generating economic opportunities and producing the minerals needed by modern society is wholly reliant on future discoveries. These discoveries will require regulatory processes that integrate environmental, social and economic goals.

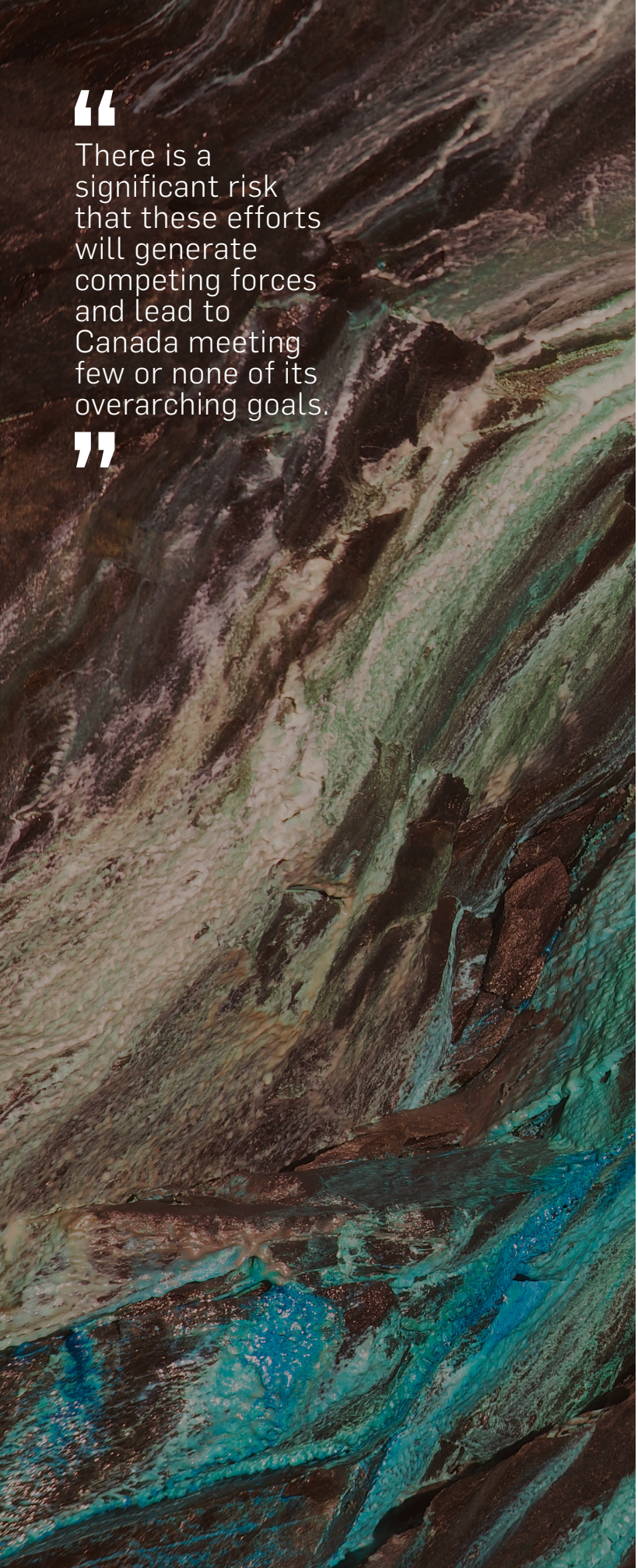
Regulation and governing bodies must be:

- Clear, consistent & transparent
- Scalable
- Timely
- Evidence-based
- Sufficiently resourced

Canada needs increased investments in vital transportation and energy infrastructure. One example is expanding the Broadband Fund. This would allow the targeting of specific regions to encourage exploration activity by providing the basic operating environment for efficient, engaged and responsible practices.

The mineral industry is the largest private-sector industrial employer on a proportional basis of Indigenous Peoples in Canada. Notably, there are over 400 active agreements between Indigenous Peoples and mineral industry companies in Canada today that incorporate Indigenous knowledge and conservation practices. Improving regulatory effectiveness and certainty regarding Free, Prior and Informed Consent (FPIC) is necessary for mutually beneficial partnerships to grow between industry and Indigenous communities, and to maximize social and economic opportunities.

PDAC welcomes Budget 2022's commitment of more than $100 million to advance a National Benefits Sharing Framework for natural resource projects, including $25 million to support Indigenous participation in the Critical Minerals Strategy through early engagement and community capacity building. PDAC recommends the government



> There is a significant risk that these efforts will generate competing forces and lead to Canada meeting few or none of its overarching goals.

direct these funds towards training and educational services for Indigenous leaders and communities to build capacity and lay the groundwork for equitable participation in future regulatory consultation processes.

Government should also develop educational tools to improve access to public geoscience and other evidence-based information to help inform decision-making at the community and regional levels.

More broadly, we encourage the government to deliver on promises to invest in education, health and critical infrastructure such as housing, water and high-speed internet. Basic access to these necessities help create equitable opportunities for generations to come.

The challenges we face as a nation are in no way small but our highly evolved mineral industry ecosystem, vast landscape and potential for new discoveries – and the impetus we have to achieve emissions neutrality – positions Canada like no other country. We are enviably positioned to be able to contribute to, and greatly benefit from, a global transition to clean energy and green technologies.

S-IMEW RETURNS

THE EXCITING RE-LAUNCH OF THE INDUSTRY-RECOGNIZED GEOSCIENCE PROGRAM

PDAC is thrilled to see the return of its celebrated Student-Industry Mineral Exploration Workshop (S-IMEW) for 2023, after a three-year hiatus due to the pandemic.

This annual workshop takes students out of the classroom to visit a world-renowned geological and mining region of Ontario for two weeks. Students gain access to exclusive access to exploration activities both at surface and underground mine sites, and are presented with unique opportunities to network with industry leaders and experts.

For upper-year geoscience students planning a career in the mineral exploration and mining industry, S-IMEW presents an avenue to apply their knowledge to mineral exploration techniques before entering the workforce. They receive practical experience in field mapping, geophysical surveys, geochemical sampling methods and core logging. They also learn about regulatory requirements, health and safety, mineral economics, environmental responsibility and community engagement, Indigenous relations and much more.

S-IMEW began in 2007 and ran for 13 consecutive years, until Covid-19 caused the annual gathering of students and professionals to be placed on hold. PDAC is excited to welcome back 26 of the top geoscience students from post-secondary institutions across Canada to this all-expenses paid two-week exploration experience in Sudbury, Ontario. Aside from the practical skills gained through the program, students also have the opportunity to network with over 80 volunteers, experts and leaders from the mineral industry.

Many S-IMEW alumni make up the volunteers and experts that students will network with during the program, as many have gone on to enjoy successful careers in Canada and around the world in the industry.

We caught up with five S-IMEW Alumni to learn about their experiences and how it shaped their careers.

> I've come across old historic mine workings, old plane wreckages, anthropological sites, had some crazy wildlife encounters, and seen some of the most breathtaking mountain top views you can imagine!
>
> **- Hannah Cavallin**
> S-IMEW ALUM

We asked the five alum the same questions, and below are the responses from Francis Hainstock (2009), Derek Leung (2018), Hannah Cavallin (2016), Danica Pascua (2011) and Pierre LeBlanc (2012).

PDAC: How did you first hear about S-IMEW?

FRANCIS: My geophysics professor recommended I apply after learning of my interest in geophysics as well exploration and mining geology.

DEREK: Through previous S-IMEW alumni in my program. I would especially like to thank Marina Schofield (S-IMEW 2014), Christopher Beckett-Brown (S-IMEW 2015), Tom Gore (S-IMEW 2016), and Elliot Wehrle (S-IMEW 2017) for introducing me to such an amazing experience.

HANNAH: S-IMEW was advertised by our Earth Science department and a professor reached out to me and encouraged me to apply.

DANICA: My class attended a presentation by a 4th year student who represented my university the previous summer. She shared her experiences at S-IMEW to give us an idea of the program. When we received the email calling for applications, I immediately applied!

PIERRE: I heard about S-IMEW from a classmate who participated the previous year. We are now happily married and enjoy a baby together.

PDAC: Is there an experience(s) or skill(s) you got from the program that you've been able to apply directly to your work and/or that have helped you in your career?

FRANCIS: The program gave me the knowledge of the exploration process as well as mining. I could relate this experience to my career early on when I was involved in potash exploration throughout Saskatchewan & the United States.

Even though it is not hard rock exploration, which was my main experience in the program, the soft rock mining exploration methods are very similar.

> Don't be afraid to leave your comfort zone and try new challenges, it may lead to new opportunities in the future.
>
> **- Francis Hainstock**
> S-IMEW ALUM

Still involves coring rock in a target zone, reviewing the geophysical data, as well as the mineralogy of the rock.

DEREK: After S-IMEW, I had the opportunity to work as a Summer Student in the Exploration Department at Glencore Sudbury Integrated Nickel Operations. It was my first experience working in industry, and my S-IMEW experience was instrumental in bridging the gap between university and industry. In particular, my first experience with core logging was at S-IMEW, and it helped me transition from having never logged core to doing it every day.

HANNAH: Yes, many! The educational and practical content of the program is directly relatable to a career in mineral exploration, so if you haven't had MinEx work experience prior to participating in the program this is where you'll get your first taste of everything from core logging to field mapping! That said, I think the most important skills and experiences from the program that have helped me in my career were the networking opportunities. There were so many events and evenings where we got direct access to industry leaders and mining professionals in a relaxed setting where we could get to know each other, ask questions, seek advice, etc. Not only that, but the other participants in the program are among the top students in Earth Sciences from across the country! So you have the opportunity to make friends and forge relationships with peers in the same place in their careers as you, and following the program the entire cohort now has the connections and support of a whole group to leverage throughout their career journey. The connections I made and the professional relationships I forged during my experience in the program are some of the most enduring relationships I have in our industry.

DANICA: Before S-IMEW, I shied away from meeting new people in networking events because I never knew how to carry myself in such situations. S-IMEW helped me become more confident in myself when networking. I now enjoy meeting new people and this allowed me to form, expand and maintain my network in the industry.

PIERRE: The numerous field visits and mine tours I went on as part of S-IMEW have been very formative experiences. It's often whoever sees the most rocks that wins and S-IMEW was a great way to see a great variety of rocks.

PDAC: Was there something about geoscience or exploration that you never would have known had you not participated in S-IMEW?

FRANCIS: I never would have got to learn all the different types of geology that we got to experience from the field tours. It was a great experience to learn the geological systems and how it related to exploration and mining. As well, learn the whole process of exploration to mine development to reclamation and all the logistics that are involved. I never had mining experience prior to S-IMEW, just exploration experience, this gave me a better understanding of the mining and exploration industry.

DEREK: Before participating in S-IMEW, I had honestly never considered a career in the industry. Attending S-IMEW broadened my horizons in terms of carving a path for myself in bridging the gap between industry and academia. For example, I am currently working on an NSERC-funded PhD project at Laurentian University on the genetic relationship between green micas ("fuchsite", "mariposite", and roscoelite) and gold deposits, which reflects my interests in economic geology and applied mineralogy. (By the way, if anyone is working on deposits that have green micas, please send them my way!) I also intend to work in industry for five to 10 years after completing my PhD to gain more field exposure.

HANNAH: The practical learning and field trips were phenomenal. We drove across Northern Quebec and Ontario stopping along various outcrops and mines across the Cadillac-Larder and Porcupine-Destor Faults. This area is one of Canada's most prolific gold districts, and has the highest historic gold production in the country. I didn't quite fully grasp the brevity of the quality of the field trips until I began to work professionally in the same area. I certainly didn't know it then, but those trips have become the foundation of my professional experience in the district!

DANICA: I heard that mining was a small world – but I didn't fully realize it until I attended S-IMEW and thereafter. I am always a few degrees of separation from anyone I meet in the industry. One participant in my year – Neil Beaton from St. Francis Xavier University in Nova Scotia – and I even became cross-shifts in Red Lake, Ontario, seven years later!

PIERRE: To have the PDAC organize such an event with the collaboration of industry partners and research institutions helped me realize how valuable we were as a workforce and how important it is to invest in the next generation of exploration geoscientists.

PDAC: Is there a fun fact about exploration you can share? And what is the most unexpected or strangest experience you've had while working in the field?

FRANCIS: Whether it be a wildcat well in an unknown area or exploration well in a well-known area it is always exciting to pull the rock from the ground and see what it looks like. My most unusual experience was when I was working in North Dakota and we got a drilling rig from Mexico to do the work. The rig and workers had never experienced any type of winter conditions before. This resulted in the whole project being filled with unexpected challenges.

DEREK: In the summer of 2017, I was a field assistant for the Metal Earth Project at Laurentian University. On our last field day, I spotted a pile of bear poop. Marina Schofield, the PhD Candidate I was working with, hovered her hands around the poop to check how hot it was and to determine how recently the bear was in the area. I asked if she could do it again, and seeing through my tactics, she responded along the lines of, "No, I'm not letting you take a picture!".

HANNAH: You honestly never know what you'll find in the woods! I've come across old historic mine workings, old plane wreckages, anthropological sites, had some crazy wildlife encounters, and seen some of the most breathtaking mountain top views you can imagine!

DANICA: I was greeted by thousands of caribou on my first rotation at a mine in Nunavut. The travel was excruciatingly long because we had to let them pass on their migration route, which crossed the road from the town to the mine. We left Mirabel (Montreal area) at 5:30 a.m. and didn't get to the mine until 8:00 p.m. The trip included a plane ride and several hours of waiting in town and on the road, and only an apple and a can of tuna to eat!

PIERRE: I was logging core at night by myself in a small tent in a remote part of Nunavut when, to my great surprise, someone burst through the door. He was a youth from Rankin Inlet, a hamlet approximately 100 km to the south, asking if I had seen his friend's ATV. They were partners on a hunting party and his friend was late for the boat ride back to their encampment. He left me a written note for me to give his friend if he ever came my way. I never saw his friend, nor did I see him again, but in the morning, drillers told me they saw two sets of lights far away in the tundra; it must have been them finding each other. However far I thought I was from the nearest civilization, as it turns out I was still in someone's backyard.

PDAC: Tell us about any industry-related growth and/or success you've had since graduation. Please give us any highlights you can think of – it could be personal or professional growth/ successes, awards or publications, etc.

FRANCIS: Since graduation, I've successfully run my own consulting business and obtained my professional designation as a Professional Geoscientist. In the last 14 years I've gained a tremendous amount of experience in my trade.

DEREK: In 2019, I had the opportunity to pursue a Masters by Research on the rock physics of curling stones at the University of Edinburgh, supported by the Scotland Saltire Scholarship, Mineralogical Association of Canada Foundation Scholarship, and Young Mining Professionals Yamana Student in Mining Scholarship, among others for which I am sincerely grateful. As an international-level competitive curler and aspiring mineralogist, I had the opportunity to make my dream thesis become a reality!

Since then, I've published two first-authored publications: one on a new mineral species named windmountainite (Leung and McDonald, 2020), and the other being derived from my undergraduate thesis on the mineralogy of curling stones (Leung and McDonald, 2022). There are also several exciting publications from my time in Scotland that are currently in press: one on seeing and hearing shear fractures with 4D synchrotron microtomography and acoustic emissions (Cartwright-Taylor et al., in press) and another on 3D-printed, modular crystal structure models (Leung and dePolo, in press).

HANNAH: I completed a Master's degree at Western University in 2017, and have been working for Yamana Gold as a Project Geologist for the past five years.

DANICA: In the last few years, I have been focused on adapting traditional paper and pencil underground mapping to the digital age. Together with colleagues, I have implemented innovative practices in mapping with a GoPro and tablet, and putting in the mapping into implicit modeling software. This has made our work up to 80% faster and more efficient.

One of my hobbies that has translated well to my professional life is learning languages. I am fluent in five languages (English, Tagalog, French, Spanish and Portuguese). I am also conversational in Russian and American Sign Language. This has helped me foster deeper connections with people I meet in the industry and opened opportunities for working internationally or with international partners.

PIERRE: I feel very fortunate to have been involved early on in my career with the Amaruq discovery in Nunavut. I am also very proud of new discoveries my team made in Meliadine. Nothing beats the atmosphere of a core shack during a discovery.

PDAC: What advice would you give to students looking at a career in exploration?

FRANCIS: Always prepare for the cycles in the mining and exploration industry. The resource industry has many ups and downs and at times it may affect your career. Don't be afraid to leave your comfort zone and try new challenges, it may lead to new opportunities in the future.

DEREK: As a student of the Earth, I like to think – quite literally – that the world is my oyster. Along these lines, my advice for students is to go out and see the world. Travel often, embrace new experiences, and challenge the status quo. Since kindergarten, I've always wanted to be a mineralogist, and I had planned out my whole life up until my undergrad. But as I learned from S-IMEW, careers are equally shaped by serendipity as they are by planning. If someone had told me at the beginning of my undergrad that I would be researching curling stones in Scotland – the birthplace of both geology and curling – I would have never believed them.

> Attending S-IMEW broadened my horizons in terms of carving a path for myself in bridging the gap between industry and academia.
>
> **- Derek Leung**
> S-IMEW ALUM

HANNAH: Be persistent. Take every opportunity. Work hard. Recognize that no career path is linear, and enjoy the ride!

DANICA: The industry is cyclical, however, never give up looking for a job. Settle for any experience you can get your hands on and do your best. You'll never know who you will meet at that job, who can connect you or vouch for you in the future!

PIERRE: Always try to go where you believe the mines are easiest to find.

PDAC: What is your fondest memory of S-IMEW?

FRANCIS: I would have to say when we went underground at the FNX Mining Levack mine. Once we got to the bottom we then tunneled it to some amazing sulphide veining. I'm normally nervous in tight places, especially underground, but it was worth it once we got to see it.

DEREK: One of my fondest memories of S-IMEW was going almost 3 km underground at the Agnico Eagle LaRonde Mine. We found some kyanite crystals intergrown with chalcopyrite, which is characteristic of a metamorphosed VMS deposit. I'd also like to give a word of appreciation for the Major Drilling sponsored vests that we received at S-IMEW 2018. After four years, I still use that vest whenever I'm in the field, and it's an excellent souvenir of my time at S-IMEW!

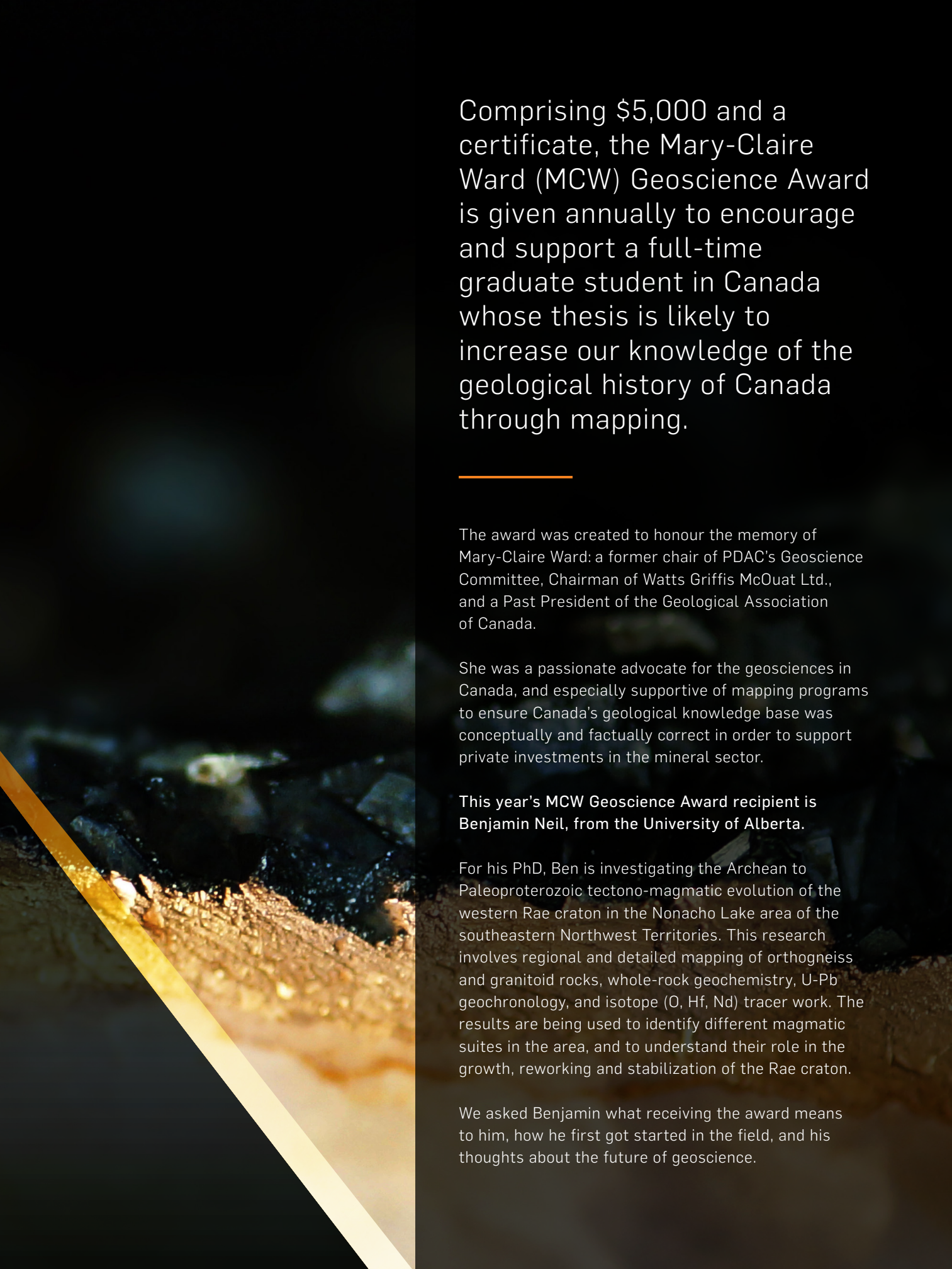
HANNAH: My fondest memory of my experience at S-IMEW is the incredible opportunity to build long-lasting relationships with friends and colleagues from across Canada in the mining and exploration industry. In just two weeks I made life-long friends, established career-altering relationships with new colleagues, and was exposed to some of Canada's top leaders and industry professionals. I would never have had these opportunities if not for my participation in S-IMEW.

DANICA: Given that I have spent most of my career underground, I am thankful to S-IMEW for having taken me on the Levack Mine tour. I remember the multi-sensory experiences of riding a man carrier with about 10 of us in the back, climbing through tight manway ladders and seeing large chalcopyrite veins and bornite-rich rocks.

PIERRE: My fondest memory was that of meeting everyone on the first day, an impressive group of individuals sharing a common love of geoscience and exploration.

MARY-CLAIRE WARD GEOSCIENCE AWARD 2022

ANNOUNCING THE 2022 RECIPIENT AND CATCHING UP WITH 2012'S RECIPIENT TO SEE WHAT CHANGES 10 YEARS CAN BRING



Comprising $5,000 and a certificate, the Mary-Claire Ward (MCW) Geoscience Award is given annually to encourage and support a full-time graduate student in Canada whose thesis is likely to increase our knowledge of the geological history of Canada through mapping.

The award was created to honour the memory of Mary-Claire Ward: a former chair of PDAC's Geoscience Committee, Chairman of Watts Griffis McOuat Ltd., and a Past President of the Geological Association of Canada.

She was a passionate advocate for the geosciences in Canada, and especially supportive of mapping programs to ensure Canada's geological knowledge base was conceptually and factually correct in order to support private investments in the mineral sector.

This year's MCW Geoscience Award recipient is Benjamin Neil, from the University of Alberta.

For his PhD, Ben is investigating the Archean to Paleoproterozoic tectono-magmatic evolution of the western Rae craton in the Nonacho Lake area of the southeastern Northwest Territories. This research involves regional and detailed mapping of orthogneiss and granitoid rocks, whole-rock geochemistry, U-Pb geochronology, and isotope (O, Hf, Nd) tracer work. The results are being used to identify different magmatic suites in the area, and to understand their role in the growth, reworking and stabilization of the Rae craton.

We asked Benjamin what receiving the award means to him, how he first got started in the field, and his thoughts about the future of geoscience.

> As someone who has benefited from mentorship throughout my undergraduate and graduate student career, I think that programs like this one, which improve access to mentorship for everyone, are an excellent idea.

Benjamin Neil
University of Alberta
2022 MCW Award Recipient.

PDAC: What attracted you specifically to the field of geoscience?

BENJAMIN: The blend of science and the outdoors. Geology was not on my radar as a potential career option when I entered university, but when I heard of summer students working for mineral exploration companies in northern Canada, I was intrigued. I enrolled in two geology courses the next semester and became fascinated with the deep history of the Earth. My first field season was with the Geological Survey of Canada in a remote region of the southeastern Northwest territories, and that experience solidified my desire to pursue a field-based geoscience career.

What did winning the MCW Geoscience Award mean to you?

BENJAMIN: It meant a great deal. Several past recipients are geoscientists who I look up to and admire, so to be considered in the same light as them was a tremendous honour.

As a graduate student, are there any tools or programs that you see in place now for students/ early graduates that you wished were in place when you first started?

BENJAMIN: Graduate students in our department at the University of Alberta have started a mentorship program, which pairs mentors and mentees from the faculty, postdoc, graduate student and undergraduate student populations. As someone who has benefited from mentorship throughout my undergraduate and graduate student career, I think that programs like this one, which improve access to mentorship for everyone, are an excellent idea.

What advice would you give to younger high school students looking at geoscience as a possible career?

BENJAMIN: Geoscience is a diverse field, so my advice would be to consider all of the different Geoscience career paths (mining/exploration, environmental, government, academia etc.) prior to making a decision. If you do choose geoscience, do not fixate on one career path but keep your mind open and aim to become a well rounded geoscientist. I am aware of several individuals from my undergraduate class (including myself) that transitioned from one geoscience career path to another after graduation.

What is the most exciting development you've seen in the field of geoscience? This could be something you've encountered yourself, or something from the past that has always fascinated you.

BENJAMIN: My PhD research uses U-Pb geochronology to understand the tectonic and magmatic history of part of the Canadian Shield. I am therefore interested in the historical development of the U-Pb dating technique. Developments in this technique from the 1970's to 90's, thanks in large part to the pioneering work of Tom Krogh, made it such that accurate and precise rock ages could be determined from a single zircon crystal. Today, we can subsample a tiny fraction of a zircon crystal to determine an age in situ. For me, the emergence of the U-Pb dating technique is still the most important and exciting development to have taken place in the field of Precambrian geology.

Do you have a five or ten year personal plan for what you'd like to be doing, or have achieved with your work?

BENJAMIN: My overarching goals for five to 10 years from now are 1) to continue to conduct field based research in an academic or geological survey position, and 2) to participate in the training and mentorship of another generation of geoscientists. What I would like to achieve with my work is always changing, but right now my hope is that my research will have a lasting impact on our understanding of the geological evolution of the Canadian Shield, specifically the Rae Craton.

What do you think we might see/what would you like to see in the future of geoscience in 10 or 100 years from now?

BENJAMIN: Geoscience research in academia, government and industry seems to be trending towards the use of 'big data' sets and advanced data analytics (e.g., machine learning) to solve problems. I think that this is an important transition, as the amount of data and information available to geoscientists now is much more than before. I would like to see an emphasis placed on the importance of integrating these new techniques with solid field observations and geological context.

Next, we talked to 2012 MCW Award recipient Deanne van Rooyen, who received the award while studying at Carleton University.

Her PhD thesis is titled "Origin and geological history of Proterozoic, Paleozoic and Mesozoic rocks in the southern Thor-Odin area, BC, based on mapping, structural, geochemical, geochronological and thermochronological constraints: Implications for accretionary tectonics and orogenesis in the southern Canadian Cordillera."

Now, 10 years after receiving the award, Deanne shared with us what originally lead her to the field of geoscience, changes she's seen both within and outside and industry, and her thoughts on resources for students and developments that can be applied going forward.

“I am very encouraged to see a growing emphasis on diversity in our science and I am really happy to see that many professional societies are taking concrete steps to improve the climate within our field.”

Deanne van Rooyen
Carleton University
2012 MCW Award Recipient

PDAC: What attracted you to this industry in the first place; describe why you made the jump from music to, specifically, geoscience?

DEANNE: I was a professional musician before I went into geology with undergraduate and graduate degrees and lots of professional experience. All I knew when I moved to Canada was that I wanted to do some kind of degree in science, with a vague feeling about going into conservation biology or healthcare eventually. I visited Carleton University one day and the wonderful first year advisor (Dr. Bob Burke from chemistry, who years later gave me my hood at my PhD graduation, thank you Bob!) told me to sign up for anything I wanted as a “special student” since I already had a bunch of degrees, and said “*if you are terrible we’ll kick you out*.” So I signed up for chemistry and biology and a lot of math and had a spot open in my schedule so I randomly picked a six-credit introductory geology/geography course. That course was my first ever introduction to anything geological. I was absolutely floored by how interesting it was, and by how much I didn’t know. Turns out I grew up on the edge of the Vredefort Impact Structure and some of the biggest gold and diamond mines in the world and also ground zero for human evolution, and had very little knowledge of any of that. I took a double major in geology and biology for a while, and after meeting my first petrographic microscope dropped the biology part entirely, and never looked back.

I think the day to day work I do as a scientist benefits enormously from my years of high-level music training. Everything is about details. As a musician you work for months on a performance that will be over in hours, and if one small passage is out of tune you will know and the whole performance will be off. If I contaminate a sample of zircons with one external grain my data will be unreliable and the whole thing will be useless. The work is also similar because scientists are the queens of delayed gratification – by the time the published paper for any study comes out one has already moved on to the next problem! But in all seriousness, persistence, attention to detail, and willingness to work through problems are completely

transferable between those very different professions. Except as a scientist I get to go outside more, and I rarely have to wear high heels and make-up! Field boots are orders of magnitude more comfortable!

PDAC: What did winning the MCW Geoscience Award in 2012 mean to you at the time?

DEANNE: I think the most important thing the MCW Geoscience Award meant to me at the time was that it gave me some much-needed confidence. The last stretch of a PhD is a long, hard slog, and getting the award in my last year as a student was an incredible boost because it showed me that the work I was doing was externally valued by experts inside and outside of academia. It was a really wonderful reminder that the work was valuable, and that I was on the right track. I remember getting a wonderful note from Al Workman from Watts Griffis McOuat Ltd. congratulating me. It said that even though I was planning to go into academia at the time there would always be room in industry for the kind of work I was doing. That was incredibly encouraging and I've often thought about that note to remind myself that there are so many great options for geoscientists. I'm also pretty sure that it played a role in me getting my first academic job very shortly after getting the award!

PDAC: Are there any tools or programs that you see in place now for students/early graduates that you wished were in place 10 years ago?

DEANNE: I think there is a much greater emphasis on career-related programs for students now. We see a lot more of that at conferences for example, with specific career-focused events for students, and with things like mentorship programs. I think it is important for students to get exposed to as many different geoscience careers as they can during their training, the more one sees of the field the better one is positioned to make informed career choices. I would have liked to have more exposure to industry career options as a student, I was fairly academically inclined so I definitely knew less than I should have about options outside of research and teaching careers. The huge variety in industry careers was definitely something of a surprise to me, but a really great one, and I am happy to know more about options now so that I can share that with my students.

PDAC: Have you seen any changes around diversity and inclusion in geoscience over the last decade?

DEANNE: Geoscience as a wide field of study is sadly still one of the least diverse out of all the sciences. I am very encouraged to see a growing emphasis on diversity in our science and I am really happy to see that many professional societies are taking concrete steps to improve the climate within our field. I have been involved in a number of initiatives centered on EDI issues by the Geological Association of Canada, the Atlantic Geoscience Society, and a number of academic programs, and I have been very encouraged by most of the responses to programs or events or ideas. Many small actions can indeed make a difference, and academic and professional societies need to play a leading role in making expectations for behavior explicit. I want all students coming into the field of geoscience to see people who look like them, to see the huge variety of careers available to them, and to know that they belong in the field.

The one thing that I am most encouraged to see is that people are a lot more willing to have conversations around expectations for behavior and activities. The work by Susan Lomas and the Me Too Mining Association, specifically with their DIGGER workshops is a fantastic example of proactive work that addresses the reality on the ground in so many workplaces. We need to expand that mindset to include all kinds of diversity, we've made progress on gender, with a concerted effort we can make progress in other areas too.

What is the most exciting development you've seen in the past 10 years in the field of geoscience?

DEANNE: From a scientific perspective I'm very excited about petrochronological tools like Lu-Hf garnet dating, new tools and modeling options for understanding metamorphism, and some of the advances in dealing with large datasets like detrital zircons or other analyses.

This is not really a scientific development as such, but I think the Geomapping for Energy and Minerals

programs by the Geological Survey of Canada (GEM-1 and GEM-2) made a huge contribution to Canadian geoscience. These programs were a great example of investment in geoscience with a strong field component, and like the Lithoprobe program many years ago, trained countless graduate students, provided a huge amount of funding and support for researchers in academia and industry, and really made significant advances in how we understand some of the most interesting geology in Canada. I really hope this kind of large-scale program continues in the future because it is impossible to replicate that kind of scope without a significant investment from government.

We know you're used to looking at rocks that are billions of years old. But what do you think we might see/what would you like to see in the future of geoscience?

DEANNE: I would really like to see the profession continue along the road to make it a more welcoming field for people from all kinds of backgrounds. We still have a long way to go to but our field is so wide and so interesting and so relevant to society that we need to put the work into making it welcoming and open and safe for everyone.

I want to see field work and field training for students get the attention and respect it deserves. Yes, geoscience is a wide field of study, and not everyone needs to be a field geologist to make important contributions, that is one of the great things about our field. However, in a lot of academia we seem to have gone too far in the opposite direction and field work is often seen as an old-fashioned approach with little "innovation" behind it. Academic grants are often focused on "innovation" or "novelty" and that sometimes results in field work being viewed as unnecessary – or as a reviewer on one of my grant applications a few years ago put it: "mere data collection". An infuriating attitude, and one that cannot be further from the truth, is when we map an area that was previously worked on we do not merely repeat the work done before us: we approach it with all the new paradigms and models and knowledge that has accumulated since it was last looked at. For example, when we work on mapping a greenstone belt today we know a lot about greenstone belts from a tectonic perspective, and we have access to all kinds of new analytical tools. But all the analytical tools or machine learning algorithms in the world cannot give you good data if your fundamental geological mapping is not accurate. We cannot simply use old maps forever because mapping is a living activity that reflects current understanding of rocks and processes. The rock types stay the same but the way we understand them changes through time. I think Mary Claire Ward's work in geoscience and her advocacy for mapping as a tool to further our understanding of all things geological is a wonderful example of leadership and vision.

I think the most important thing I want to see in geoscience is the recognition that it is an extremely wide field that is relevant to every sector of society. I want everyone in the field to realize and understand that there is room for all kinds of geoscientists; field experts, lab experts, modelling experts, and all the rest. Most of all, I want everyone who enters the field to experience the best of it and to feel that they belong here – everyone has something to contribute!

“
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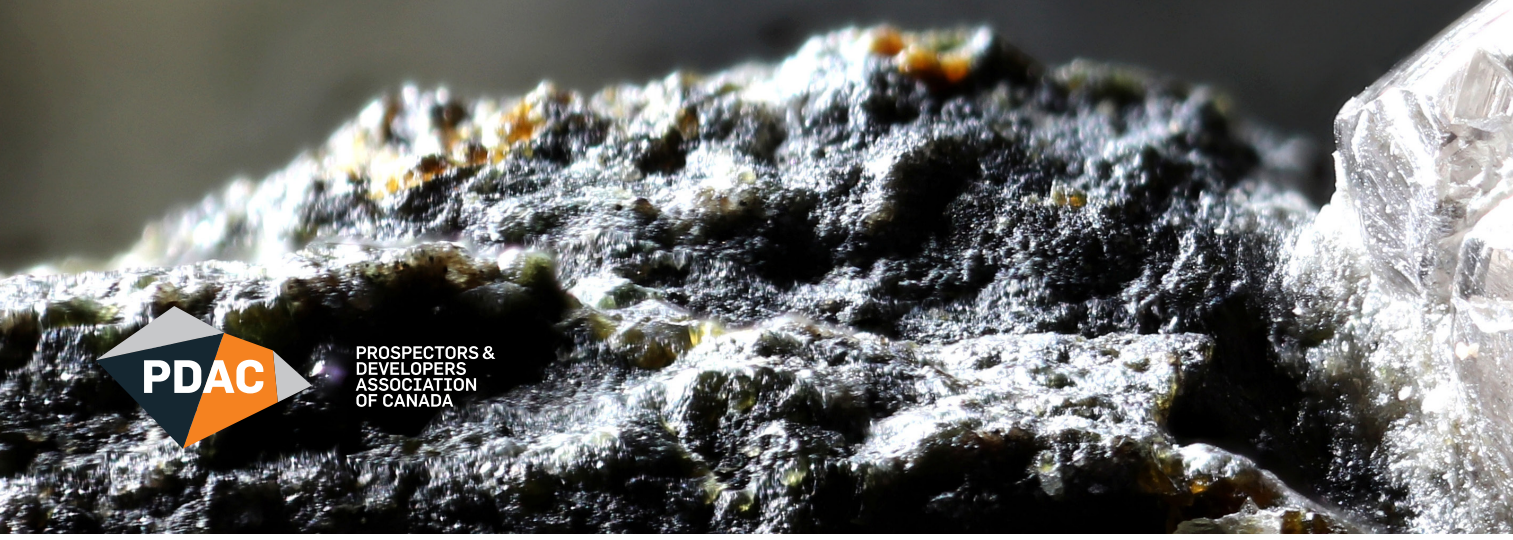

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